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BY W. W. C. TOPLEY, M.D. CAMB., F.R.C.P. LOND.,

PROFESSOR OF BACTERIOLOGY, UNIVERSITY OF MANCHESTER.

THE section of the Founder's "Suggestions" which justifies me in bringing to your notice the experiments which I propose to describe is, I think, worth quoting, for it shows the breadth of his outlook on the problems of preventive medicine. Written in 1877, it runs as follows:—

"As there is good reason to believe that the science of Human Pathology would be profitably advanced by a better knowledge, than is possessed by most medical men in this country, of the diseases of the lower animals, and especially of domesticated animals, I would suggest that the *occasional* examination of various topics relating to Epizootics and to general Comparative Pathology might possibly be introduced with advantage as a subject for a few lectures.

"In the present day, when we hear so much about various spreading Epizootics, respecting the origin and modes of the diffusion and the distribution of which there appears to be considerable diversity of opinion among educated Veterinary practitioners, it might be desirable, as it seems to me, that the evidence collected by competent Veterinarians from a sufficient number of well-verified data, should, in the interests of Science and of the public welfare, be from time to time weighed and sifted by medical men who have paid special attention to the study of the course of epidemics among the human race, in order to determine whether the natural laws which regulate or affect the development and progress of the two classes of morbid phenomena are analogous, or otherwise. Such comparative scrutiny could scarcely fail to advance the cause of general scientific truth, and would serve also to the elucidation of sound principles for the guidance of safe prophylactic and preventive legislation."

I have departed from the letter of the Founder's injunction only in selecting as material for study small laboratory animals, which can be bred and observed under strictly controlled conditions, so replacing the method of simple observation by the method of experiment. From its spirit I do not think that I have departed at all.

The view which Dr. Milroy expressed 50 years ago, that the diseases of man and animals should be studied in close relation to one another, has steadily gained adherents. The liaison between human and veterinary pathology, which has developed so rapidly in recent years, will, I believe, lead to a rapid advance in our knowledge of disease in general and of infective processes in particular. In this country we owe a great debt to the late Sir Clifford Allbutt for his persistent advocacy of the more thorough study of comparative pathology. The problems of epidemiology, of the incidence of disease on herds rather than on individuals, have attracted many of the masters of medicine. The subject is intrinsically interesting as a purely biological problem, and it touches so closely the future welfare of the human species that it cannot be ignored by any who are concerned with the development of our social organisation.

It would take too long to discuss in any detail the different methods of approach towards the main problems of epidemic disease, which have been followed by investigators in the past; moreover, this question has recently been dealt with elsewhere. I should like, however, to record my personal conviction that our present lack of knowledge is largely the outcome of faulty methods of inquiry. If it be true, as I believe, that the origin and spread of any epidemic of microbial infection depends upon variations in the normally existing relations between living organisms, and that the actual outbreak of disease, the occurrence of clinically recognisable cases, is only the end-result of a progressive disturbance of this normal equilibrium, then the problem passes from the strictly medical to the general biological field.

When the study of epidemic disease as a general phenomenon is established on a firmer scientific basis, it may, I think, come to be recognised that the epidemiological Apostolic Succession has passed not through Hippocrates and Sydenham, but through Aristotle and Darwin. I would hazard the guess that the "Origin of Species" will one day be regarded as the most important single contribution to the canon of preventive medicine, and it is interesting to note that the rôle of disease as a selective agent was not ignored by Darwin himself. In his chapter on the Struggle for Existence he writes:

"When a species, owing to highly favourable circumstances, increases inordinately in numbers in a small tract, epidemics—at least, this seems generally to occur in our game animals—often ensue; and here we have a limiting check independent of the struggle for life. But even some of these so-called epidemics appear to be due to parasitic worms, which have from some cause, possibly in part through facility of diffusion amongst the crowded animals, been disproportionably favoured; and here comes in a sort of struggle between the parasite and its prey."

It will be generally admitted that the more we know of the microbial parasite of any given disease, of its normal distribution in nature, and of its mode of conveyance from host to host, the more successful we are likely to be in snapping some link in the chain of causation which leads up to the epidemic prevalence of the disease in question. It is significant that some of our most striking successes have lain in the field of tropical medicine and in diseases in which an insect vector of infection is involved. Perhaps one of the most perfect examples of the application of biological science to the prevention of disease is afforded by the success which has been attained by stocking stagnant or slowly-moving collections of surface water with top-feeding minnows; which feed on the larvæ; which would develop into the mosquitoes; which would transmit the malarial parasite from host to host.

This is nothing but the application to preventive medicine of Darwin's account of the red clover. As you will remember, it runs:

"From experiments which I have lately tried I have found that the visits of bees are necessary for the fertilisation of some kinds of clover; but humble-bees alone visit the red clover (*Trifolium prætense*), as other bees cannot reach the nectar. Hence I have very little doubt that if the whole genus of humble-bees became extinct or very rare in England, the heartsease and red clover would become very rare, or wholly disappear. The number of humble-bees in any district depends in a great degree on the number of field-mice, which destroy their combs and nests; and Mr. H. Newman, who has long attended to the habits of humble-bees, believes that more than two-thirds of them are thus destroyed all over England. Now the number of mice is largely dependent, as everyone knows, on the number of cats; and Mr. Newman says: 'Near villages and small towns I have found the nests of humble-bees more numerous than elsewhere, which I attribute to the number of cats that destroy the mice.' Hence it is quite credible that the presence of a feline animal in large numbers in a district might determine, through the intervention first of mice and then of bees, the frequency of certain flowers in that district."

The successful prevention of microbial disease has, however, by no means been confined to diseases in which we can eliminate, or reduce to negligible numbers, some insect vector of infection. In my concluding lecture I shall refer briefly to some of the more striking examples, in which an adequate knowledge of the biological factors involved has enabled us to bring about a significant reduction in the ravages of some particular infective disease. All such examples teach the same lesson, the need of a wide biological outlook, if such problems are to be solved. It follows that those methods which have proved their value in general biological research are likely to help us here. Among those methods, both direct experiment and biometry have proved their worth beyond all question. I hope to convince you that the application of a combination of these methods to the study of the

spread of epidemic disease promises to yield results of some interest.

It is just seven years since I brought to the notice of this College, in the Goulstonian lectures,[1] some preliminary experiments on the spread of bacterial infection among mice. Since that date I have been largely occupied with experiments designed to yield further information on the same problem.[2-16] It soon became evident that the data derived from such experiments would require analysis by statistical methods far beyond my own capacity, and it was my great good fortune to interest Dr. Major Greenwood in this line of investigation. For the last five years we have worked in close coöperation, and all those experiments, which have seemed likely to yield data of statistical interest, have been jointly planned, and the results jointly considered. As the result of this five years' experience, it has become clear to us that it is only by such close coöperation that results of value are likely to be obtained. It is not enough that the statistician should analyse the results obtained by the bacteriologist. He must take a full share in designing the experiments and in following their course. Similarly, the results of biometrical analysis must be carefully considered in the light of the bacteriological findings, and fresh experiments must be planned to elucidate particular questions which such an analysis has left unanswered.

Many of the results which I wish to lay before you are, therefore, the outcome of a joint investigation,[17] for which Dr. Greenwood and I are equally responsible and which we hope to continue. Many of the issues raised are susceptible of experimental investigation without the aid of statistical methods other than those involved in any biological inquiry. If, from the results of such experiments as we are carrying out, it should be possible to formulate any general description of the spread of epidemic disease, it will clearly be necessary to test the validity of such generalisations by statistical analysis of the data of epidemic diseases as they occur in man and animals under natural conditions, and so to develop the inquiry on its purely biometrical side. At the present moment, we believe that the best hope of elucidating the main questions at issue is to combine the experimental and statistical methods, by developing an experimental biometry of epidemic disease, in which the bacteriological and immunological factors shall not be so complex, and so little susceptible to control, as to defy analysis, while the numerical data shall not be so slight as to preclude the application of statistical methods of inquiry.

In 1922 Flexner,[18] Lynch,[19] Amoss,[20 21] and Webster [22 23] published from the Rockefeller Institute a series of papers recording an independent investigation into epidemics among mice; and from that time onward Webster [24-36] and Pritchett [37-39] have carried out a large series of experiments bearing upon the spread of enteric infection among these animals. Recently, Webster [40-44] has also studied the spread of a respiratory infection in rabbits. During the last few years Neufeld,[45-47] Lange,[48-51] and their co-workers in the Robert Koch Institute in Berlin have investigated many different problems in connexion with the factors which determine natural infection among mice.

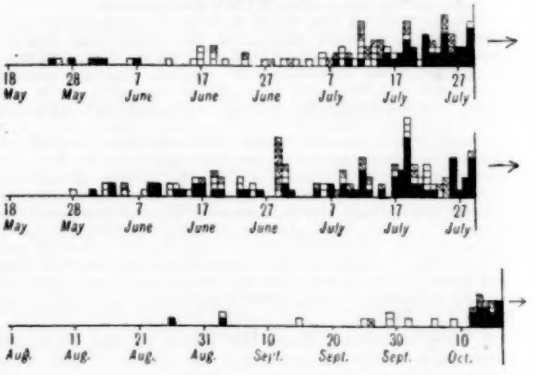
Thus since 1919 there has been accumulated a considerable mass of data bearing on the infection of mice with those bacteria to which they are a natural prey, a problem which is essentially different from the study of the reaction of laboratory animals to bacteria which do not attack them under natural conditions, and which show little tendency to spread from host to host. Many of the experiments recorded, including those which Dr. Greenwood and I have carried out in collaboration, have been specifically designed to investigate the actual spread of epidemic infection among mice, in the hope of obtaining information with regard to the general form of such epidemics under varying conditions. We have hoped in this way to discover certain broad relations, which may later be susceptible of more detailed analysis, by further experiments designed to elucidate isolated problems. Other experiments have been devoted to attempts to solve particular questions with regard to the mechanism of infection with those bacteria which are known to be capable of epidemic spread.

In these lectures I propose briefly to summarise the knowledge which has so far been gained, considering first the data which we have obtained with regard to the general character of such epidemics, and then discussing the factors which may be concerned in producing the observed results.

THE GENERAL CHARACTERS OF EXPERIMENTAL EPIDEMICS AMONG MICE.

It is unnecessary to refer here to the technical difficulties involved in experiments of this nature, since they have already been considered elsewhere.[4] The only point which need be noted is that all mice which die, and which are not eaten by their companions, are submitted to a full post-mortem examination, including the preparation of cultures from the heart's blood and from the spleen. The unfortunate prevalence of cannibalism among these animals does not allow us to ascertain the cause of every death which occurs, but the majority of the many thousands of mice whose fate has been recorded have been in a condition which has rendered an

CHART 1.



adequate post-mortem examination possible, and it may safely be asserted that our inability to obtain a complete bacteriological record with regard to every death has not obscured the general course of events. The only two diseases which have so far been studied in any detail are mouse-typhoid and mouse-pasteurellosis, and it is with these alone that we are here concerned.

The Pre-Epidemic Phase.

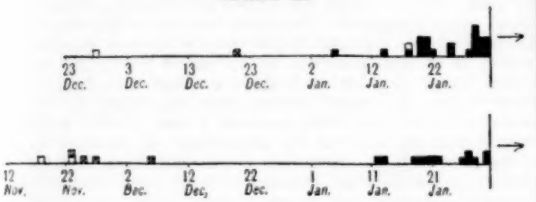
It is logical first to consider those observations which have been made on the initiation of experimental epidemics, but it happens that this part of the problem has, up to the present, received relatively little attention. The great majority of the experiments so far completed have been concerned with the later stages of the epidemic process. The method employed in initiating the spread of infection has differed. In most experiments normal mice have been added to others which have been infected by feeding with the bacterium to be studied; in other cases the infecting mice have been survivors from earlier epidemics. In some experiments a large number of normal mice have been added to their infected fellows in a single batch; in others daily additions have been made, or batches of varying size have been added irregularly.

The records available,[4] inadequate as they are, allow us to form some picture of the different ways in which the specific mortality may be distributed during the pre-epidemic period. The salient points are sufficiently depicted in Charts 1, 2, and 3. In these charts each square corresponds to the death of a single mouse. Where a square is blackened a post-mortem examination established the presence of the

particular infection being studied. Where a square is left unshaded such an examination yielded no evidence of this infection, and death was presumably due to some other cause. Where a square is marked with a cross the condition of the dead mouse rendered a post-mortem examination impossible. The arrow to the right of the chart indicates that the epidemic, once established, progressed well beyond the date on which the record ceases.

The three experiments recorded in Chart 1 were concerned with the spread of mouse-typhoid. They

CHART 2.



were each commenced by feeding a certain number of mice on the causative organism, and thereafter adding normal mice to the cage. In each experiment it is clear that a considerable period may elapse between the occurrence of the first death due to the specific infection and the rise of the first epidemic wave. It will be seen that, during the pre-epidemic phase, there may occur a considerable number of deaths from causes other than the specific infection which is being studied. Such a rise in the mortality from all causes has frequently been noted as a precursor of the main wave of mortality in an experimental epidemic. Whether it has any real significance is a question which has still to be answered.

The two experiments recorded in Chart 2 were initiated by adding to survivors from a previous epidemic of mouse-typhoid four times their number of normal mice, the additions being made in each case as a single batch on the day on which the record begins. In each case it will be noted that a considerable time elapsed before there was any death from mouse-typhoid; such deaths then became more frequent and led up to a typical epidemic wave.

CHART 3.

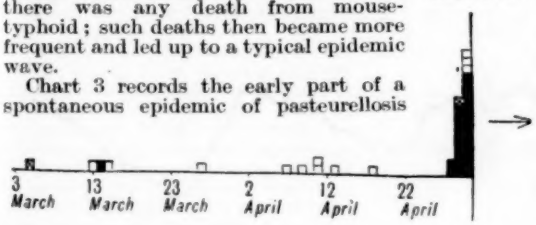


Chart 3 records the early part of a spontaneous epidemic of pasteurellosis which occurred among a batch of some 120 mice, which had been collected in a single cage for another purpose. They had not been intentionally submitted to any risk of infection. It will be noted that a single death from pasteurellosis occurred on March 14th. From then onwards until April 26th a few scattered deaths occurred in the cage, but post-mortem examination of the dead mice revealed no recognisable cause of death. On April 27th two mice died of pasteurellosis, and these deaths were immediately followed by a large wave of mortality from this disease. It may be noted that this spontaneous outbreak of pasteurellosis among our normal stock, which occurred in March, 1921, formed the starting-point of all our experiments on this infection. This disease has never again appeared among our normal animals.

It is clear from these few experiments that the introduction of infected animals into a normal herd does not suffice immediately to initiate an epidemic of disease, if by an epidemic we mean a wave of morbidity associated with mortality. In these and in all similar experiments our recognition of an epidemic of disease must perforce be based on the observed mortality, since we cannot recognise infection with any certainty in the absence of death.

We must assume that during the pre-epidemic phase some process goes forward which leads to a progressive alteration in the equilibrium between parasite and host, and that it is only when a certain limiting condition has been reached that an epidemic wave of mortality is propagated. In a careful survey of an epidemic of summer diarrhœa Peters [53] observed a sequence of events curiously similar to that recorded in the early stages of these experimental epidemics in mice. He uses the term "epidemic potential" to describe the balance of interacting forces which tends towards the occurrence of an outbreak of disease, and this term appears appropriate and adequate. Employing it, we may assume that the pre-epidemic phase is characterised by a rise in epidemic potential, and that when this has reached some limiting value the next stage of the process, the rising wave of mortality, makes its appearance.

The significance of variations in the form of the pre-epidemic phase, and especially the relation, if any, between the form of this part of the total epidemic process and the form of the subsequent wave of mortality, will be referred to later.

The Epidemic Phase.

We may now consider the effect, as judged by the mortality curve, of allowing normal mice to gain access to a cage in which an epidemic is fully established. The first experiment of this kind [2] was concerned with an epidemic of mouse-typhoid, and the results are recorded in Chart 4. On the date when this record commences the epidemic had already been under way for some months, during which the losses by death among the population at risk had been made good by the irregular addition of normal mice. During the greater part of the period covered by the chart normal mice were added at the rate of three a day, irrespective of the number of deaths. During the last 45 days the daily additions were reduced to two animals. On the upper base line are recorded the daily deaths. The lower curve represents the daily cage-population. The general character of the progress of mortality is at once obvious. When susceptible mice gain access to the cage at a steady rate the deaths are not uniformly distributed in time, nor do they occur in a purely random fashion. They are grouped in a series of waves, each wave showing minor fluctuations. In Chart 4 there are four such waves, of which the third and fourth are more distinctly separated than are the first and second. These may be followed either on the mortality chart or on the cage-population curve. Successive maxima or minima are separated by periods of between 30 and 40 days. The minor fluctuations in the number of daily deaths are probably of no importance.

It would appear that, when enteric infection is allowed to spread among a herd of mice which is recruited by the addition of susceptibles at a constant rate, some process is set up which waxes and wanes in a more or less regular manner. The equilibrium between parasite and host seems to be a shifting one. As the result of some series of changes, the parasite appears to obtain a temporary mastery; so that a considerable proportion of the mice at risk fall victims to a fatal infection. This is followed by a phase in which there is a decreased tendency for the occurrence of fatal infection, and the death-rate falls. As fresh susceptibles accumulate this succession of events is repeated, and the deaths increase to a fresh maximum, only to fall again when this maximum is passed. The other point to be noted is that there is no evidence that the process has any natural limit in time. This experiment, of which Chart 4 shows a part, was continued over nine months. It was brought to an untimely end by the appearance in the cage of an unrelated infection. Had it been possible to prolong it, there is no reason to suppose that the course of events would have been modified in any essential respect. This point is brought out still more clearly in the experiments next to be described.

During the past four years Dr. Greenwood and I have carried out a considerable series of experiments which have enabled us to study this problem in much greater detail.[17] The infection selected for study was mouse-pasteurellosis. A series of epidemics were started, in one case by submitting mice to contact with others which had contracted a spontaneous infection, in others by feeding a number of mice on *Pasteurella muris* and thereafter adding susceptible mice to the cages in which they were housed. In each case the experiment was continued by adding normal mice to the cage at a constant rate, this rate varying in the different experiments. Six such experiments have been performed. The rate of addition and the period of observation in each experiment, up to the autumn of 1924, are shown in Table I. The number

TABLE I.

Expt.	No. of mice added daily.	Duration of expt. in months.	Expt.	No. of mice added daily.	Duration of expt. in months.
3	6	8½	2*b*	1	17
2*a*	3	26	5	1 : 2*	7½
4	2	7½	6	1 : 3*	7½

* In Expt. 5 one mouse was added every other day. In Expt. 6 one mouse was added every third day.

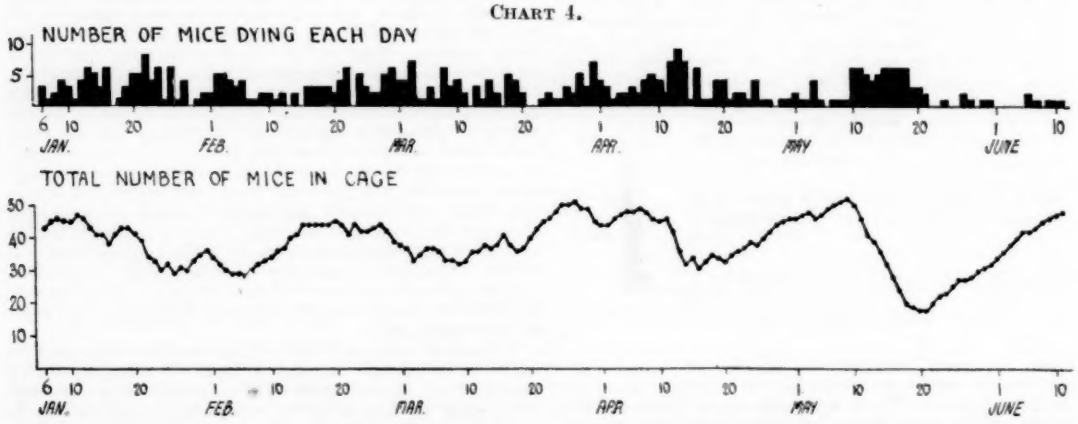
given to each experiment corresponds with that recorded in a report which has been published elsewhere.[17]

In these experiments the progress of mortality has been studied in terms of death-rates, instead of in terms of the actual number of deaths occurring in unit time. In preparing the graphs minor irregularities have to some extent been smoothed out by recording, as the death-rate for any given day, the quotient obtained by dividing the sum of the deaths for the five days of which that day is central by the sum of the cage populations on the same five days. The rate obtained is of the actuarial type—i.e., the probability of dying within the unit of time, the q_x of the life table, instead of the central death-rate, the m_x of most medical publications. There is little difference in the values obtained in this case, but the life-table rate was needed for other purposes and was therefore used throughout. For a full description of the fluctuations in the death-rate reference must be made to our full report. In Chart 5 are recorded the death-rates observed over a five-monthly period in each experiment. The rate recorded is that due to specific mortality. It includes those deaths in which a diagnosis of pasteurellosis was based on a post-mortem examination, followed by the isolation of the causative organism, and those deaths in which cannibalism prevented us from definitely establishing the cause of death. It excludes those deaths in which a post-mortem examination revealed no evidence of pasteurellar infection. We believe that the use of this figure gives us the best approximation to truth at all periods when pasteurellosis is actively spreading in the cage. Almost every dead mouse examined during such periods is found to present the typical lesions of the disease and to yield cultures of *Pasteurella muris* from its tissues. The degree of cannibalism, on the other hand, varies according to the total population of the cage at any moment, according to the particular inclinations of the mice forming that population, and according to the frequency with which the cages are examined and the dead mice removed. In experiments which have to be carried on without interruption over a period of years, it is not possible to examine the cages with equal frequency on each day, so that the degree of cannibalism is subject to random fluctuations. Our records show that the general form of the graphs would not be altered by excluding all deaths, save those in which the diagnosis of pasteurellosis had been definitely established, but the picture presented would certainly depart far more widely from truth than that obtained by the plan which we have followed. One *caveat* must be entered. When few deaths are occurring in a cage, so that the population is steadily increasing, and the appetites of the mice are perhaps whetted by a feeling of general well-being, there is a definitely increased tendency for any mouse which dies to be rapidly devoured by its companions. When, therefore, the death-rate of any herd is very low—as, for example, in the later stages of Experiment 6—the majority of the mice which die over a long period may escape post-mortem examination, and the specific death-rate as above defined may be misleading.

The period of each experiment covered by Chart 5 is selected as giving the best representation of the entire graph for the corresponding epidemic. In the case of Experiments 3, 4, 5, and 6 it covers almost the whole of the actual period of observation up to the end of September, 1924. In Experiments 2*a* and 2*b* it corresponds to periods when fluctuations in the death-rate were well marked. One further point must be noted. The significance of the recorded fluctuations obviously depends on the number of mice on which the rate is based. When the population at risk is small the ratio of the observed death-rate to its probable error may be so low that little significance can be attached to the fluctuations observed. We should pay little attention to small movements in the death-rate, or to the occurrence of irregular or isolated movements when the population at risk is small. The main fluctuations are, however, certainly not due to errors of sampling.

The general character of the progress of mortality in these six epidemics of pasteurellosis is at once obvious from the chart. In Expt. 3, in which six mice were added to the cage each day, the average death-

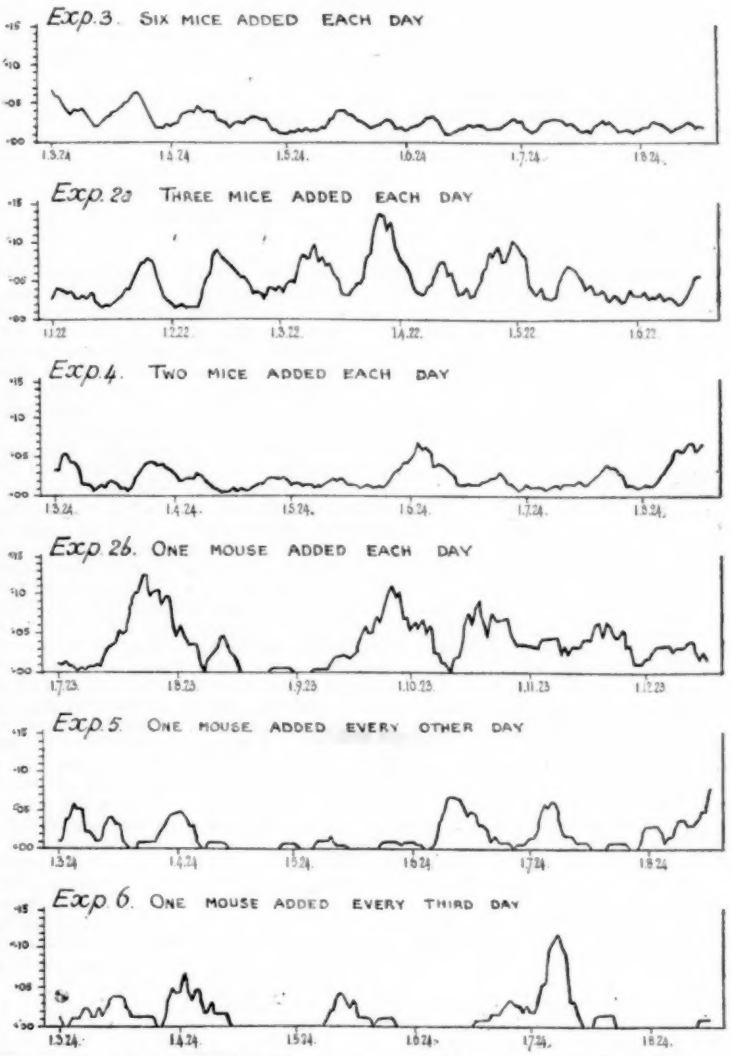
CHART 4.


NUMBER OF MICE DYING EACH DAY
10
5
6 10 20 1 10 20 1 10 20 1 10 20 1 10 20 1 10
JAN. FEB. MAR. APR. MAY JUNE
TOTAL NUMBER OF MICE IN CAGE
50
40
30
20
10
6 10 20 1 10 20 1 10 20 1 10 20 1 10 20 1 10
JAN. FEB. MAR. APR. MAY JUNE

rate is high, but the fluctuations are small. We seem to be approximating to a high but steady death-rate. In Expt. 2*a*, in which three mice were added daily, the average death-rate is also high, higher indeed than in Expt. 3, but the fluctuations are well marked. One wave of mortality follows another without any quiet interval, but they show little tendency to fuse with each other during the period covered by the chart. In Expt. 4, in which two mice were added each day, the average death-rate is lower, but the fluctuations are well marked and distinct. In Expt. 2*b*, in which one mouse was added each day, the average death-rate is lower again, but the waves are very distinct and well separated. In Expt. 5, in which one mouse was added every other day, the average death-rate does not differ appreciably from that observed in Expt. 2*b*, but the waves are very clearly differentiated, and in some instances are separated from one another by quiet intervals during which no death from pasteurellosis occurred. In Expt. 6, in which one mouse was added every third day, the average death-rate is lower again, and the waves of specific mortality are here separated by well-marked quiet intervals, during which the epidemic appeared to have died down completely, only to break out again after an interval. This experiment has now been continued without interruption for over two years and is still in progress. There has occurred during this period a long, quiet interval of over ten months, during which no death from pasteurellosis was recorded; subsequently a further series of waves of specific mortality have been observed.

In Table II. are set out the death-rates recorded in the six experiments, for the whole period of observation up to the end of September, 1924. It will be observed that, with the exceptions of Expt. 2*a* and Expt. 5, there is a steady fall in the death-rate as the rate of addition of susceptibles decreases. In this table there are two additional columns, which give the average daily population in each cage, and the average daily ratio of the number of mice which had lived in the cage for less than 30 days to the number which had been at risk for more than 30 days. It will be noted that there is, except in the case of Expt. 6, a closer correspondence between this ratio and the death-rate than between the death-rate and the average total number of mice at risk. This is particularly striking when we compare Expts. 3 and 2*a*. The ratio of the average numbers at risk is as 155·7 to 63·5, whereas the specific death-rates are as 0·0264 to 0·0366. The herd with an average population two and a half times as large as the other has a lower death-rate. The average under-over 30 ratio, on the other hand, is 2·1 in the herd with the average death-rate of 0·0264, and 2·3 in the herd with the average death-rate of 0·0366. Thus the herd with the higher death-rate, although it has the smaller total number of mice at risk, has a higher average proportion of recent immigrants. (Chart 6.)

CHART 5.


Exp. 3. SIX MICE ADDED EACH DAY
Exp. 2a THREE MICE ADDED EACH DAY
Exp. 4. TWO MICE ADDED EACH DAY
Exp. 2b. ONE MOUSE ADDED EACH DAY
Exp. 5. ONE MOUSE ADDED EVERY OTHER DAY
Exp. 6. ONE MOUSE ADDED EVERY THIRD DAY

Showing daily death-rates in six continued epidemics of mouse pasteurellosis.

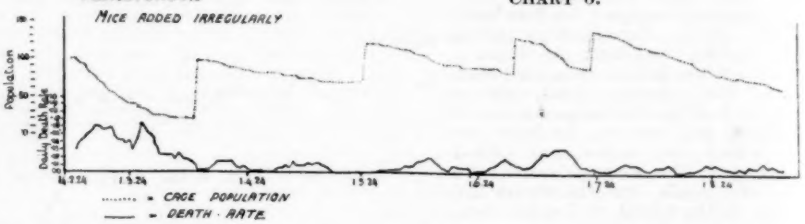
TABLE II.

Expt.	No. of mice added per day.	Average daily death-rates q_x (specific deaths).	Average daily ratio of numbers under 30 to numbers over 30 days.	Average daily population.
3	6	0·0264	2·1	155·7
2*a*	3	0·0366	2·3	63·5
4	2	0·0244	1·6	60·6
2*b*	1	0·0184	0·97	40·8
5	1 : 2	0·0190	1·2	20·2
6	1 : 3	0·0124	1·0	15·2

It is of some interest to inquire how the course of events will be modified if the addition of normal mice be made irregularly, instead of at a steady rate. In connexion with our investigation of mouse-pasteurellosis we have carried out one such experiment in which we started with 20 infected mice and added 80 normal mice to them on 14/2/24. Another 80 were added on 19/3/24, 50 on 3/5/24, 50 on 11/6/24, and 50 on 1/7/24. Chart 6 shows the sequence of events. The black continuous line records the fluctuations in the specific mortality-rate. The upper broken line shows

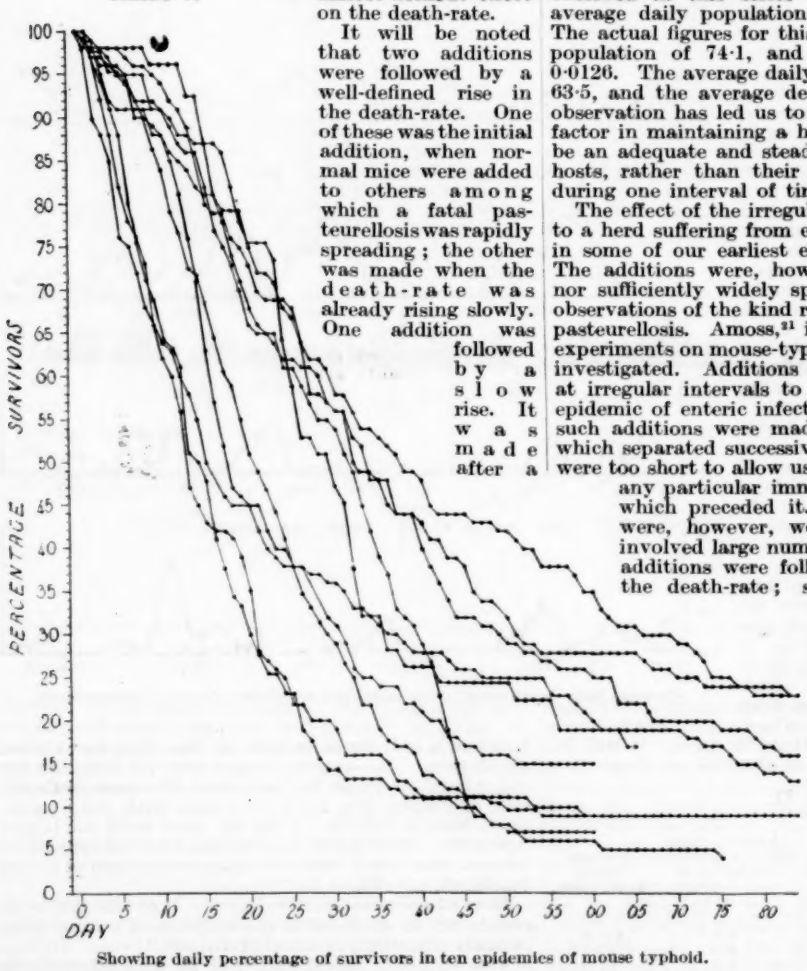
the variation in the cage population, and indicates the points at which additions were made. It will be seen that the first addition was followed by a large initial wave of mortality, which is two-peaked, and which had almost subsided when the second addition was made on 19/3/24. This addition had very little effect on the rate of mortality, which remained at a low level and had fallen to zero when the third addition was made on 3/5/24. This addition was followed by a slow and slight rise in the death-rate, which shows three fluctuations before the next addition was made on 11/6/24. This addition was made shortly after the small wave of mortality which began on 1/6/24 had passed its crest. It was followed by a very definite rise in the death-rate, leading to a wave which had passed its crest and fallen almost to zero when the final addition of normal mice was made on 1/7/24. This addition was almost without effect on the death-rate.

CHART 6.



It will be noted that two additions were followed by a well-defined rise in the death-rate. One of these was the initial addition, when normal mice were added to others among which a fatal pasteurellosis was rapidly spreading; the other was made when the death-rate was already rising slowly. One addition was followed by a slow rise. It was made after a long interval had elapsed since the first large wave, during which a low death-rate had prevailed. Two additions were followed by no significant rise in the death-rate. Each was made immediately after the subsidence of a considerable wave of mortality. It would be unwise to stress in any way this relation between the phase of the epidemic at which an addition is made and its effect on the subsequent death-rate. Far more thorough investigation will be needed before we can arrive at any just conclusion on this point. We may, however, note that the immigration into an infected herd of relatively large numbers of normal animals, in a single batch, may sometimes be followed by a considerable rise in mortality, and at others may have little apparent effect. It may also be noted, and this is a point of some interest, that the average specific death-rate among this herd was the lowest but one observed in this series of experiments, while the average daily population was the highest but one. The actual figures for this epidemic gave an average population of 74·1, and an average death-rate of 0·0126. The average daily population in Expt. 2*a* was 63·5, and the average death-rate was 0·0366. This observation has led us to suggest that the important factor in maintaining a high epidemic potential may be an adequate and steady circulation of susceptible hosts, rather than their presence in large numbers during one interval of time.

CHART 7.



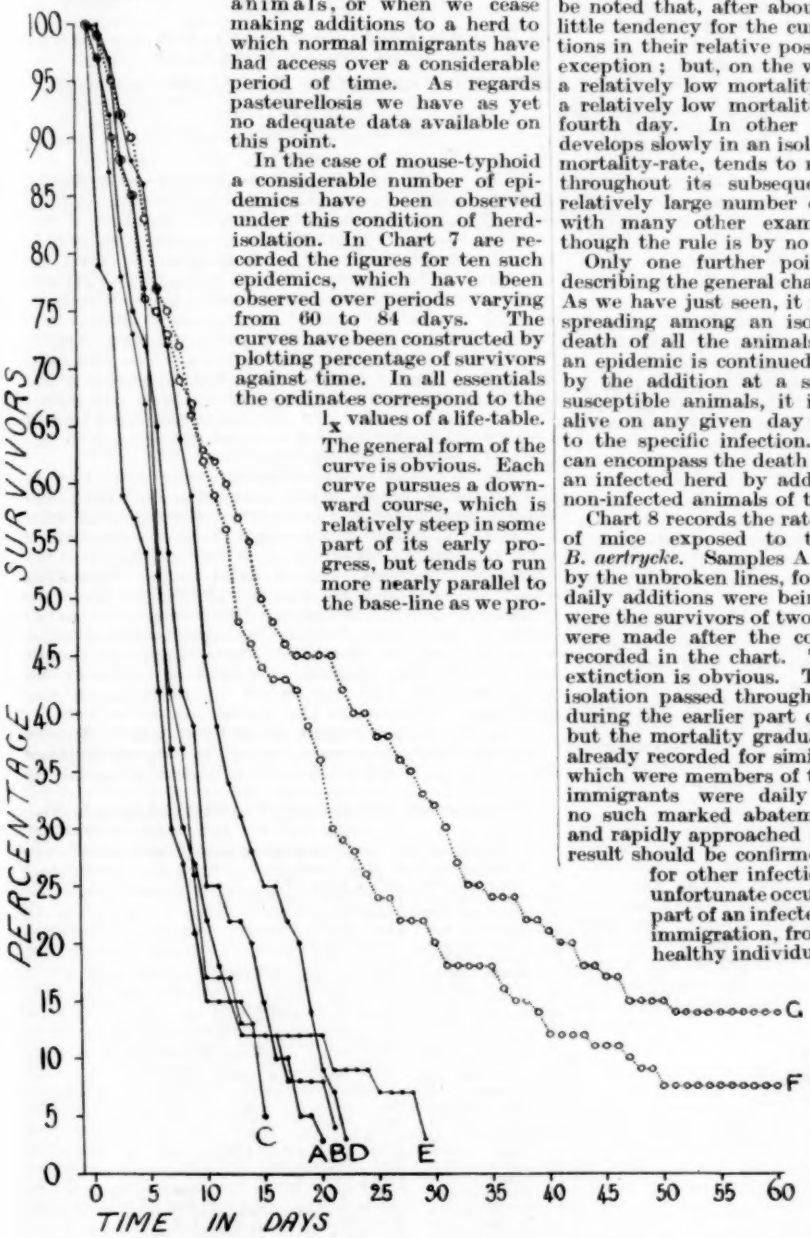
Showing daily percentage of survivors in ten epidemics of mouse typhoid.

The effect of the irregular addition of healthy mice to a herd suffering from enteric infection was studied in some of our earliest experiments on this disease. The additions were, however, neither large enough nor sufficiently widely spaced, to allow us to make observations of the kind recorded above in the case of pasteurellosis. Amoss,[21] in 1922, recorded a series of experiments on mouse-typhoid in which this point was investigated. Additions of normal mice were made at irregular intervals to a community in which an epidemic of enteric infection was spreading. Twelve such additions were made, but six of the intervals which separated successive additions from each other were too short to allow us to differentiate the effect of any particular immigration from that of those which preceded it. The remaining additions were, however, well separated in time and involved large numbers of mice. Some of these additions were followed by a marked rise in the death-rate; some were almost without effect. The results recorded by Amoss for mouse-typhoid are thus very similar to those which we have observed in pasteurellosis. There is, however, a difference in technique, which may have introduced a disturbing factor. In our experiments all mice at risk were housed in a single cage, thus ensuring as uniform an admixture as possible of the individuals within the experimental herd. In Amoss's experiments the mice were housed in a large number of small cages, and infection was spread from cage to cage by the activities of the attendant during the routine process of cleaning and feeding. Opportunities for random variations may therefore have intervened in these epidemics which were absent from our own experiments; but the general course of events, over the long period covered by Amoss's investigation, does

not suggest that the fluctuations in mortality were due in any large part to variations in the effectiveness of the carriage of infection from cage to cage.

There remains for consideration the sequence of events, observed when an epidemic is allowed to spread among a herd of mice without any additions, beyond the initial mixture of infected and susceptible animals, or when we cease making additions to a herd to which normal immigrants have had access over a considerable period of time. As regards pasteurellosis we have as yet no adequate data available on this point.

CHART 8.



In the case of mouse-typhoid a considerable number of epidemics have been observed under this condition of herd-isolation. In Chart 7 are recorded the figures for ten such epidemics, which have been observed over periods varying from 60 to 84 days. The curves have been constructed by plotting percentage of survivors against time. In all essentials the ordinates correspond to the l_x values of a life-table. The general form of the curve is obvious. Each curve pursues a downward course, which is relatively steep in some part of its early progress, but tends to run more nearly parallel to the base-line as we proceed further to the right. In all cases deaths have become relatively infrequent by the sixtieth day, and have almost ceased to occur at the end of three months. In all cases a certain proportion of mice are left alive on the day when the experiment terminates, the percentage of survivors varying, in the experiments here recorded, between 6 and 33 per cent. There is no reason to suppose that, had these experiments been further continued, any appreciable increase in the total specific mortality would have been noted. It would appear that an epidemic of mouse-typhoid which is allowed to run its course among a herd of mice kept in isolation will result in a total mortality varying between 65 and 95 per cent., but will seldom or never lead to the complete extermination of the herd.

There is another point in connexion with this series of curves to which we would draw attention. It will be noted that, after about the thirtieth day there is little tendency for the curves to show marked alterations in their relative position. There is one striking exception; but, on the whole, the herd which shows a relatively low mortality on the thirtieth day shows a relatively low mortality on the sixtieth or eighty-fourth day. In other words, an epidemic which develops slowly in an isolated herd, as judged by the mortality-rate, tends to run a relatively mild course throughout its subsequent stages, and to leave a relatively large number of survivors. We have met with many other examples of this phenomenon, though the rule is by no means an invariable one.

Only one further point need be referred to in describing the general characters of these experiments. As we have just seen, it is unusual for any epidemic, spreading among an isolated herd, to lead to the death of all the animals at risk. When, however, an epidemic is continued over a long period of time, by the addition at a steady or irregular rate of susceptible animals, it is found that all the mice alive on any given day tend ultimately to succumb to the specific infection. It would appear that we can encompass the death of certain individuals among an infected herd by adding to the herd normal and non-infected animals of the same species.

Chart 8 records the rate of extinction of six samples of mice exposed to the risk of infection with *B. aertrycke*. Samples A to E, whose fate is recorded by the unbroken lines, formed part of a herd to which daily additions were being made. Samples F and G were the survivors of two herds, to which no additions were made after the commencement of the period recorded in the chart. The difference in the rate of extinction is obvious. The mice which were kept in isolation passed through a period of high mortality during the earlier part of the period of observation, but the mortality gradually subsided in the manner already recorded for similar isolated herds. The mice which were members of the herd to which susceptible immigrants were daily gaining admission enjoyed no such marked abatement of their risk of death, and rapidly approached complete extinction. If this result should be confirmed in future experiments and for other infections, it would appear to be an unfortunate occurrence for individuals forming part of an infected herd to be subjected to the immigration, from without that herd, of other healthy individuals of their own species.

CONCLUSIONS.

The following conclusions seem to be justified by the evidence which has been summarised above.

In experiments in which the environmental conditions are kept relatively constant, in which meteorological variations can apparently play little part, and in which the food-supply is adequate in amount and constant in its general character, the admixture of healthy and infected mice is followed by the epidemic spread of those bacterial diseases which have been studied.

The initial mixture of infected with susceptible hosts is followed by a pre-epidemic phase of variable duration, in which infection is certainly spreading among the population at risk and may cause the death of some individuals within the herd, but during which the epidemic potential has not attained a level which will result in a well-marked wave of mortality.

When the pre-epidemic stage has been passed and a definite epidemic prevalence of the disease has been established, the further course of events is largely determined by the rate of immigration of susceptible hosts. If no such immigration occur the epidemic gradually dies down, leaving a varying number of survivors.

If susceptible animals be added regularly to the herd the form of the fluctuations in the resulting death-rate and its average value are mainly determined by the rate of immigration. With a moderate immigration rate the deaths tend to occur in a series of well-marked waves without any quiet interval. If the rate of immigration be diminished the waves of mortality tend to be more widely separated from each other, the intervening quiet intervals sometimes lasting over several months. If the rate of immigration be increased successive waves of mortality tend to become fused together. The average death-rate may not be so high as that observed at the peak of a wave of mortality during an epidemic in which the immigration-rate is much lower, but the fusion of the waves results in a high and relatively steady death-rate.

If irregular additions be made, the effect of such additions on the subsequent death-rate may vary widely. It would seem that the effect of any one addition is largely determined by the equilibrium between parasites and hosts which exists at the time when that addition is made. The irregular addition of large batches of susceptible animals appears to result in a lower average death-rate than that which follows the frequent and regular addition of smaller batches, even though the average population at risk be larger in the former case than in the later. There is a suggestion that a steady circulation of susceptibles is a more important factor in favouring the epidemic spread of disease than is the total number of mice exposed to risk.

There is some evidence to suggest that an epidemic, which spreads slowly among an isolated herd during its earlier stages, will lead to a smaller total mortality than will another epidemic of the same disease, which spreads rapidly within a short time of its initiation. There is also evidence to suggest that a herd among which an epidemic is spreading will approach extinction more rapidly if it be subjected to the immigration of susceptibles of the same species than if it be kept in isolation.

A bacterial infection which tends to spread naturally from mouse to mouse under the conditions of these experiments may be maintained in an experimental herd for an indefinite period of time, on the sole condition that the herd be replenished by the immigration of susceptible animals, even though the rate of immigration be very slow. In general it would appear that the movement of susceptible but uninfected individuals is one of the main factors in determining the course and duration of the epidemic spread of bacterial disease.

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(Continued at foot of next column.)

Lettsomian Lecture

ON THE

PRINCIPLES OF TREATMENT IN RELATION TO DISEASES OF THE NERVOUS SYSTEM.

Being the Second Lettsomian Lecture in 1926, delivered before the Medical Society of London on Feb. 24th,*

BY E. FARQUHAR BUZZARD, M.D. OXF., F.R.C.P. LOND.,

PHYSICIAN TO ST. THOMAS'S HOSPITAL.

I AM not infrequently told that neurological practice must be very disheartening, as there is little or nothing to be done for organic diseases of the nervous system. This indictment holds equally true for all other branches of medical practice, if we lay no claim to be healers or if we appraise impartially and ungrudgingly the silent influence continually exerted by Nature against the forces of disease and refrain from over-calling any share we may have in the success of our combined efforts. Not the least difficult of our responsibilities is that of weighing the results of treatment, of eliminating from our minds the post hoc, propter hoc process of reasoning and of reviewing all obvious and isolated conclusions in the light of accumulated experience.

From a physiological point of view neurology is distinguished from other specialties in that the organs with which it is concerned are endowed with a number of dominating functions in the absence or failure of which those of all other organs, however healthily preserved, are of little value. Speaking anatomically, the brain and spinal cord, at any rate in the majority of instances, differ from most other organs in possessing little or no superfluous material. These are two considerations which impose, or should impose, on the surgeon a degree of restraint he is unaccustomed to feel when invading other less particular territories of the human frame.

It is, perhaps, unseemly for a physician to discuss in public the terms upon which his surgical brother should be invited to his assistance, but, in order to

* The first lecture appeared in THE LANCET, Feb. 20th, p. 377.

(Bibliography: Continued from preceding column.)

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forestall reproach, I will preface the remarks I propose to make on the indications for surgical intervention in cases of intracranial tumour by stating at once that my respect for brain surgery has been steadily growing for many years. We should be thankful that the risks and responsibilities it involves and the frequent disappointments with which it must necessarily be associated have not deterred its exponents nor checked its scientific progress. It is, perhaps, impossible for anyone to rate the value of surgical intervention in relation to tumours of the brain who has not seen and followed a large number of cases. There must be many medical men whose small personal experience in this direction can only have led to pessimism, just as there may be others with equally meagre, but more fortunate, experience who have become unduly optimistic. Without being in a position to offer you statistical proof for the opinion, I hold the view that the results obtained from surgical intervention are far more satisfactory than they were 20 years ago, and that credit for this can be allotted not solely to advances in surgical skill, judgment, and technique, but also to the fact that the diagnosis is, on the whole, made earlier and more accurately than it used to be.

The subject under discussion is one in which principles of treatment are so intimately involved in the question of diagnosis that I must ask to be excused if I appear to wander a little way from the title of these lectures.

SURGICAL INTERVENTION IN TUMOURS OF THE BRAIN.

The problem most commonly presented to us is of the following nature. The conclusion has been arrived at that a patient's symptoms are due to the presence of a tumour involving a part of one cerebral hemisphere or one lobe of the cerebellum. Although confident about its localisation we are unable to form any exact opinion as to its nature. We have applied such tests as seem necessary to put a gumma out of court, and we find no evidence to suggest that the cause of trouble is a secondary neoplasm. Examination of the blood and cerebro-spinal fluid as well as the history of the patient do not favour, although they cannot absolutely negative, the possibility of an abscess or a tuberculoma, and radiology has failed to throw any light on the question. The nature of the lesion can now only be ascertained by inspection through an opening in the skull, and upon what is found at the operation depends the answer to the question whether permanent or only temporary relief of symptoms can be afforded. If there is a menace to vision in the shape of papillœdema or if headache and vomiting have been prominent symptoms, almost certain relief can be promised, but beyond that it is wise to refrain from prophecy.

At this stage I would lay emphasis on the fact that intracranial exploration is a field of surgery which is rich in surprises. When everything has seemed to point to the presence of an infiltrating glioma with its attendant bad prognosis, we may find an endothelioma or chronic abscess capable of complete removal, or vice versa. But there is another point to which I would draw special attention and which has not, perhaps, attracted the notice it deserves in this connexion. The most promising group of cases of intracranial tumour, from the point of view of permanent relief afforded by operation, is that in which headache, vomiting, and optic neuritis are symptoms conspicuous by their absence. In spite of the fact that we have all been taught to regard these as the cardinal symptoms of intracranial tumour, we must look to cases without them for providing perhaps the majority of examples of successful treatment. This is not merely a question of early diagnosis, although it means much to the surgeon that his services should be called upon before intracranial tension is much raised. It is due to the fact that slow-growing endotheliomata may reach a very large size without provoking the cardinal symptoms and that they can often be entirely removed with little fear of any recurrence. Two instances illustrating this axiom and presenting slight but important differences in their clinical histories may be worth a brief description.

Clinical Cases.

CASE 1.—On June 8th, 1918, a young man, about 25 years of age and apparently in perfect health, was out riding when he felt his eyes being forced involuntarily to his left side. This passed off in a few seconds, but later in the day the same thing recurred, followed by forcible turning of the head to the left and some twitching of the left side of the face and loss of consciousness. Fits, resembling either the first or second of those I have described, were repeated at intervals up to the time when he came under my observation early in December of that year, but in between the attacks he was well and the only headache he experienced was after a severe fit.

I had many opportunities of examining the patient in the course of the next six weeks, and during the whole of that time there were no physical signs, in particular no optic neuritis, no headache, and no vomiting. At the end of the first week in January, 1919, I noticed slight weakness of the left face and a diminished abdominal reflex on the same side. On Jan. 12th Mr. P. W. G. Sargent operated at my request, turned down a large osteo-plastic flap in the right frontal region, and removed an encapsuled hard tumour about the size of a hen's egg, evidently growing from the under surface of the dura mater and embedded in, although easily detached from, the frontal lobe.

The patient recovered rapidly and perfectly from the operation, was prescribed some bromide to take regularly, and had three fits in the course of the next 12 months. These attacks continued to recur at long intervals, but when I heard from the patient at the end of December, 1925, he had been free from fits since August, 1924, and had been leading an active and busy life for several years.

CASE 2.—On Oct. 1st, 1924, I was consulted by a man, 52 years of age, who had always led a very active life and who, in 1902, had sustained two somewhat severe falls from horseback, resulting in slight concussion but no serious after-effects. In 1922 he first noticed a tendency to bump into objects on his left side and took medical advice with the result that his Wassermann reaction was tested and proved negative. In April, 1924, he noticed some failure of his left leg when salmon-fishing, and that his left hand was becoming clumsy. He did not complain of headache, although he admitted that a severe physical strain would sometimes provoke a slight pain in his head. He was convinced that an exostosis in connexion with his seventh cervical vertebra, which had been revealed by an X ray photograph of his spine, was the source of his disabilities.

On examination he proved to have complete left hemianopia, a slight loss of postural sensibility and tactile discrimination in his left hand, a diminished left abdominal reflex, and an extensor response on stimulating the sole of his left foot. There was no optic neuritis but a slight though definite slowness of cerebration and perhaps some mental confusion.

A very good X ray photograph, taken by Dr. Shires, revealed a slight thickening of the bone in the right parieto-occipital region. On Oct. 22nd, 1924, Mr. Sargent removed an endothelioma as large as a man's fist from the surface of the brain in the right parieto-occipital region, with the result that three months later he appeared to be perfectly well, able to lead a fairly active life, and to have regained practically the whole of his left visual field. When I saw him a year after his operation he was able to enjoy a stiff day's partridge shooting and to do his share of ornithological execution.

A number of interesting questions are raised by a consideration of these two stories. Among those which cannot be discussed now are (*a*) why did the first patient suffer from fits and why did the second present complete freedom from that symptom, and (*b*) what is the relationship of injury to the development of neoplasm? There was no history of head injury in the first case, and a history of two fairly severe blows on the head in the second case occurring 20 years before any symptoms of an intracranial tumour were manifested. On the other hand, the records of these two patients do illustrate the importance of attaching no weight to the absence of headache, vomiting, and optic neuritis when surgical intervention is being considered in relation to intracranial tumours. Further, I would urge that the administration of bromide should always be prescribed after such operations, and that it should be continued for a few months even when there is no history of fits either before or after the removal of the tumour,

and for many years in those cases in which fits have been a prominent feature. Finally, I would draw attention to the complete recovery of the left visual field in the second patient after treatment in spite of the fact that it must have been greatly encroached upon for a period of at least two years.

May I, in the next place, drive home the principle that intracranial surgery is full of surprises and, by way of illustration, cite a case in which I certainly neglected it.

CASE 3.—About a year ago a boy, 11 years of age, was brought to me with a history of having suffered for three months from early morning headaches, accompanied by occasional vomiting, and from persistent diplopia. On examination he was found to hold his head inclined to his left shoulder, to have papilloedema in both eyes with rather more swelling in the left, coarse nystagmus more marked on looking to the right, weakness of the right superior oblique muscle, perhaps a little ataxy affecting the left leg more than the right, and a diminished left abdominal reflex. These symptoms and physical signs pointed without doubt to raised intracranial pressure due to the presence of some foreign substance in the posterior fossa. There was a strong family history of tubercle on the mother's side and a brother of the patient had recently died from tuberculous meningitis. Notwithstanding the absence of pyrexia and of any abnormal constituent in the cerebro-spinal fluid, I came to the conclusion that the law of probability favoured the diagnosis of a cerebellar tuberculoma, and I advised prolonged and complete rest with as much good food and fresh air as were obtainable. For this purpose he was admitted under my care into St. Thomas's Hospital. Headache and vomiting became gradually less severe and less frequent, but the optic neuritis and other ocular signs persisted. After watching him carefully for nine months and finding no improvement in the condition of the optic discs, I decided to ask Mr. Sargent to decompress the posterior fossa, still believing that a tuberculoma, perhaps inactive and encapsuled, would be found. As it turned out there was discovered a simple but large meningeal cyst, the evacuation of which has completely relieved the patient of his symptoms and has led to the disappearance of his papilloedema. The operation might have been carried out nine months earlier with equally good results if the principle of looking at the brain before finally deciding on its nature had been followed.

In this particular instance there seemed to be some justification for the course I adopted, and I might still be inclined to do the same under similar circumstances. Possibly I may, in future, exercise my patience for a somewhat shorter period of time before seeking the help of my surgical colleague. At the same time, having the patient under almost daily observation, I was able to watch the optic discs and to ask for the relief of pressure before any atrophic changes supervened on the neuritis, thus eliminating any risk of the visual acuity becoming permanently damaged.

From what has been said already, you will gather that I do not regard the localisation of intracranial lesions as a difficult task compared to that of determining their nature, and that one of the most important indications for surgical intervention is in many cases the necessity for seeing and feeling the tumour. If, on the other hand, the tumour is so placed that its removal is out of the question, there is no need to ascertain its nature by exploration, although a decompression may be indicated for the purpose of relieving suffering. The latter operation should be avoided if relief can be afforded by other measures, as the prolongation of life associated with a cerebral hernia of gradually increasing dimensions is an experience which is undesirable in the interest of the patient and of his family. It is hardly necessary to add that once an operation has been decided on, delay in carrying it out may be attended with grave risk when headache and vomiting are severe or when the patient's pulse is becoming slow or his respiration disturbed in rate or rhythm. Sudden death a few hours before a contemplated operation is an occurrence which is not as uncommon as it is avoidable.

THE TREATMENT OF EPILEPSY.

We must sadly admit that the last quarter of a century, although not devoid of praiseworthy efforts, has seen little light thrown on the pathogenesis of epilepsy, and has supplied us with no substantial reasons for altering what may be termed its traditional treatment. Were it not, indeed, that certain principles of treatment, in my opinion of considerable value, are frequently overlooked or neglected, I should have been tempted to omit their consideration from these lectures.

Before embarking on a task already sufficiently invested with gloom by its note of introduction, let me allay some of your fears by expressing at once my intention of confining my remarks to the principles governing the treatment of epilepsy in its earliest stages and avoiding those which are concerned with the care of patients suffering from the disorder in its established form.

In order to lay down principles governing the treatment of any disorder it is desirable to accept, even if only provisionally, some theory, however vague, which appears to offer an explanation of its origin and qualities. In regard to epilepsy, which I describe purposely as a disorder rather than a disease, I propose to accept the view that it is a manifestation of instability on the part of some important nervous mechanism closely allied to, if not identical with, the vasomotor system. In other words, I regard epileptic attacks, slight or severe, as only the occasional outward and visible signs of some permanent underlying nervous state which is inherent in a certain proportion of the population. I would go, perhaps, further and submit that we are all epileptic in the sense that under entirely favourable circumstances and to sufficient provocation even the most stable of us might respond in an epileptic manner. If we exclude individuals whose personalities have been altered in the course of years as the result of constantly recurring fits and of all their psychological consequences, and also the mental defectives among whom epileptic phenomena are common, and pay attention only to children who have had but a few attacks, it is impossible to say that the majority of them are very different from their companions in the intervals between their attacks. At any rate, they are rarely recognised as being in any way exceptional, either by parents or medical attendants, until the occurrence of one or more fits gives them their distinctive mark. While it is true that psychological investigations have seemed to show that the minds of most epileptics approximate to a certain type, workers in this field of research do not suggest that the type of mind is confined to epileptics, nor do they attempt to explain why only a proportion of persons possessing it are subject to fits. Again, we are aware that out of a hundred persons who suffer from head injuries of moderate severity, a small number will subsequently develop epilepsy, but we should find it very difficult to identify that small number beforehand, or to point out the characteristics which distinguish them from their fellows afterwards.

There are many other similar considerations bearing on the nature of epilepsy, all of them deserving careful study, but as I am concerned for the moment with those which may throw light on principles of treatment, I will refer briefly only to two or three. It is a matter of common knowledge that the onset of several acute specific fevers is not infrequently associated with epileptic attacks in children, very rarely in adults, and that such children may never manifest any epileptic tendencies at any other times. Again, the occurrence of attacks only during dentition or during a short period of time about the age of puberty is within the personal knowledge of most of us. Finally, we have to remember a small group of individuals who, apparently normal in every other respect and often leading very active and useful lives, are subject to occasional epileptic attacks at long intervals and who may be described as none the worse for them.

If, with such information at the back of our minds, we accept the view that epileptic attacks are only manifestations of a permanent degree of instability on the part of some nervous mechanism, if we agree that this instability is usually exaggerated by repeated attacks, and if we do not deny that in a small proportion of cases treatment meets with success, it is clear

that early diagnosis of the disorder and the frank recognition that a cessation in the occurrence of attacks does not in any way constitute a cure or justify the neglect of whatever successful measures may be in force, are two of our most important therapeutic necessities. This belief has, in my case, received much encouragement from experience, in that most of the cases met with in private or hospital practice which have responded to treatment have been diagnosed at a very early stage and have persevered with treatment for long periods of time.

"Embryonic" Signs as an Aid to Early Diagnosis.

Early diagnosis of epileptic instability before any of its manifestations have appeared on the scene is an ideal which in the present state of our knowledge seems almost out of reach, but the next best thing would be a more general recognition of its most trivial "embryonic" signs. Common among these are so-called regional jerks which precede other epileptic phenomena by many months and sometimes by years. They may be best described as identical with the involuntary sudden jerk of a limb which most people have experienced at some time or another when in the twilight of sleep. They occur frequently at that time and still more frequently in the morning either before the patient leaves his bed or while he is dressing. So violent may they be that articles in his hand may be flung to the other end of the room or, if a leg is involved, a fall to the ground may result.

Another early manifestation is a form of aura without its subsequent developments. This is often subjective, in that only the patient can describe it and he sometimes fails. There is some momentary interruption in the continuity of his mental processes associated perhaps with some local sensory disturbance, a smell, a vision, a feeling of tingling, or just what the patient may call a "wave of unreality." Such auræ are not accompanied by any lapse of consciousness, a feature of its next development, the petit mal attack. It is to be noted that these trivial epileptic phenomena resemble the more mature forms in their partiality for occurring in the borderland between sleep and full awakedness, a time when we may assume that the circulation in the higher nervous centres is in an unstable state of transition.

But these phenomena are not trivial if their true significance is appreciated and they should all be assessed as manifestations of the epileptic state, as characteristic as a major attack. A history of such embryonic signs preceding the first convulsion can often be obtained from patients who come for advice and it is rarely found that they have been regarded seriously. If treatment were more commonly initiated with their appearance, I am convinced that we should meet with more success.

But there are other stories relating to the development of epilepsy to which, on account of their frequency, reference must be made. A child, apparently healthy and about 12 or 13 years of age, has a major epileptic attack. Ingenuity is exercised in finding a satisfactory explanation and the word "epilepsy" is not even whispered. The excitement of an evening spent at the "pictures" or an unusually hearty meal suffice as plausible excuses for the patient's lapse from grace. Perhaps a bottle of a bromide mixture is prescribed and duly drunk, and then life is resumed as if nothing had happened. Six months later the second fit occurs and perhaps the blame for it is again satisfactorily apportioned. Three months elapse before the third fit comes along and treatment is commenced, nine months too late. A variation of this tale is supplied by the patient who is treated with bromide for six months after the first attack; the medicine is then cut off and the second fit occurs within the next few months.

I should like to lay down the principle that any manifestation of epilepsy in childhood should insure treatment being persevered with until adult life has been reached, however successful it may have been n preventing any repetition of the first sign. Even then the cessation of treatment should be carried out very gradually and with caution. A dog is allowed one bite before appropriate treatment is carried out; a child should not be allowed to exhibit any manifestation of epilepsy without the immediate initiation of proper therapeutic measures.

Individual Treatment.

We have next to consider the treatment which must take into account the inherent and, perhaps, permanent instability as well as its various forms of expression. To deal with the latter first, each case must be studied as a separate problem. What have appeared to be the exciting causes, emotional disturbances, fatigue, bad atmospheres, indiscretions in diet, and so on? Measures for their avoidance must, if possible, be taken. But in laying down any restrictions with this object in view we should be strongly influenced by a desire to make the child's life as little different from that of his fellows as possible, and so to prevent the inevitable psychological effects which accompany the consciousness of such an unenviable distinction. In this connexion I would earnestly deprecate the not uncommon practice of interfering with a child's education on the plea that his brain must be relieved from all strain. While agreeing that his or her work should be carefully regulated and the conditions, physical and psychological, under which it is done critically reviewed, I have never been able to satisfy myself that the occupation provided by lessons is anything but beneficial. The same remark applies with equal force to games, so long as they are wisely supervised. It is much more likely that fault can be found with the psychological atmosphere of a school than with its work or play.

In the next place, brief reference is due to those physical sources of irritation which loom so large in the eyes of the public, and sometimes of the profession, as agencies of disease. Septic tonsils, adenoids, errors of refraction, worms, and vulvitis no doubt may play a part as exciting causes, but their correction does not relieve the doctor of his responsibility for dealing with the underlying instability without which no manifestation of epilepsy would have made its appearance.

Finally, we must turn to the medicinal measures which are at our disposal and which, in my opinion, are the only ones which exert an influence on the essential disorder of nervous function. Here we are faced by very real difficulties based on the profound prejudice with which the use of the bromide salts is regarded, chiefly, but not solely, by the lay mind. This prejudice might appear extraordinary to many of us, did we not recognise that it has grown from the misuse rather than from the use of our most valuable remedy. That it has been tried in large numbers of cases without success and that it has appeared to do harm in many others are sufficient grounds for its discredit. Nevertheless, allowing for individual idiosyncrasies which must necessarily influence our use of any drug, the bromides have been convicted, through no fault of their own, of many crimes of which they are not really guilty. Given irregularly, or for too short a time, they are blamed for lack of success. Given in too large or too frequent doses they are responsible for toxic states which are inevitable. Given in appropriate doses without success, a result which must often ensue, especially when their use has been too long delayed, the depression really attendant on their failure to cure is laid at their door.

The Use of Bromides.

It is when we review our successes that we find the evidence requisite for a belief in the beneficence of bromides and in the factors essential for their favourable action. Let me summarise briefly the principles which should govern their use. (1) They should be prescribed as soon as any manifestation of epilepsy makes its appearance, irrespective of any excuses which may be manufactured for the latter.

(2) The dose should be the minimum required for its purpose, a matter requiring general as well as particular experience. (3) The number of doses in 24 hours should be as small as possible, and should be timed in accordance with any special features of the case under consideration. In nocturnal epilepsy, for instance, a dose at bedtime is often all that is required; in other instances a dose half an hour before leaving bed in the morning is desirable. (4) The administration must be regular and continued for an indefinite time according to age and other circumstances, certainly not according to any rule of thumb such as one, two, or three years. (5) A small quantity of arsenic, 2 or 3 minims of Fowler's solution per dose, should always be given with the bromide.

If these principles were more universally observed, I am convinced that the percentage of cases of epilepsy successfully treated would be greatly increased, and that the popular notion in regard to bromide exerting a depressing influence on the mental activity of patients would disappear. It has been my experience, not once but many times, to hear from patients that they are happier and brighter as the result of taking bromide, an opinion heartily endorsed by those with whom they are in daily contact. I believe that bromides exercise a specific stabilising influence on some nervous mechanism apart from any effect that they may have on general reflex excitability.

While pinning my faith to bromides, I am not insensible to the value of other drugs as adjuvants, and there is no doubt that luminal has proved useful, sometimes alone, but more often in combination with bromide. It is a drug, however, which some patients cannot tolerate at all and which others cannot continue to take as long as is desirable without ill-effects. Borax, belladonna, and digitalis may be added to bromide mixtures, sometimes with advantage, but it is difficult to lay down any indications for their employment, and a long experience of the first-named does not permit me to share the optimistic views which have been expressed concerning its value.

Although introducing the subject of epilepsy in sufficiently gloomy terms, you may have been led by subsequent remarks on the use of bromides to regard me as a fanatical optimist obsessed with the idea that a sufficient ingestion of these salts would suffice to rid us of one of the greatest scourges of the human race. Unfortunately, I hold no such faith, realising, as one must, that a large proportion of our epileptic patients are more or less degenerate before they are obviously epileptic and that no method of treatment, even if successful in eliminating fits, would make of them efficient citizens. But it is time that something was said to combat the unjustifiable prejudice which prevails in many quarters against our most powerful weapon in the treatment of epilepsy. Greater moral courage is required of us in two directions; first of all, the courage to recognise and frankly confess the first evidences of epilepsy; and secondly, the courage to insist, in spite of all opposition, on the importance of immediate and long-continued treatment on the lines I have indicated. Epilepsy is a form of disorder which must be firmly suppressed without delay, and kept in subjection by fearless and unrelenting vigilance over a period of time which admits of no definition.

SYPHILIS OF THE NERVOUS SYSTEM.

In the course of my first lecture I ventured to submit that as physicians we should never claim to cure disease. May I now go a step further and submit that syphilis of the nervous system would be practically unknown if we did not claim to cure syphilis. That statement is not strictly accurate because there are always a number of persons who become infected with syphilis, who are either unaware of the fact or who neglect to be treated, and who may at any time develop syphilitic lesions of the nervous system. But with these exceptions the patients who present themselves to us with tabes dorsalis, general paralysis of the insane, cerebral syphilis, syphilitic myelitis, &c., have mostly been sacrificed to the time-honoured but groundless tradition that a medical man possesses the knowledge which justifies him in telling a patient that he has been cured of syphilis. It is true that large numbers of patients suffering from syphilis are cured, and it is probably equally true that more are cured now than used to be 20 years ago, but the fact remains that we have no means of deciding in any particular case whether or not a cure has been effected. Twenty years ago we used to see patients suffering from tabes dorsalis who had been "cured" of syphilis by means of courses of mercury lasting from two to five years, according to the personal predilections of the curer. Now we are constantly meeting with similar sufferers who have been "cured" by drastic courses of arsenical compounds, in addition to or without mercury.

The public have always asked for cures and in deference to their wishes we have weakly claimed the power to cure. If we were scrupulously honest and not lacking in courage, the profession would long ago have refuted the claim to cure syphilis, and having successfully dealt with all active evidence of the disease, would have addressed their patients in words such as these:—

"You have been put through a course of treatment which has been successful in ridding you of all signs of active disease, and experience tells us that if you will submit to some anti-syphilitic treatment about twice a year, perhaps a course of pills or a few injections, you need have no fear of further trouble. If you ask me how long this must go on, my only honest answer must be 'for the rest of your life.' We have no means of deciding whether you are permanently cured, and you must regard your periodic courses of treatment as a method of health insurance with so sound a policy that you will be relieved of all anxiety in regard to your future. Yes, this line must be adopted even if the Wassermann reaction in your blood is negative. Prevention is far better than cure, and freedom from constant worry is better than both."

This is the kind of talk suitable for a patient whose primary chancre has just disappeared under treatment; but it would do equally well for a case of syphilitic myelitis or basal meningitis after successful treatment.

In regard to what are known as the parenchymatous forms of syphilis of the nervous system, general paralysis, and tabes dorsalis, the results of anti-syphilitic treatment are less constant in their encouragement. The former disease has still to be considered as incurable, although I have seen a few good results from the administration of powerful antisyphilitic remedies renewed at frequent intervals. The length of time which has elapsed since the apparent recovery of the patients is still too short to enable one to judge whether the remission of symptoms holds out hope of permanent relief. Other remedies have been advocated from time to time, only to be discarded after a brief enjoyment of favour, and I am inclined to believe that the malarial treatment of which much has been heard during the last few years is doomed to share their fate.

Tabes Dorsalis.

With the treatment of tabes dorsalis it is quite a different story. In my pre-graduate days we were taught that antisyphilitic remedies were useless, sometimes even harmful, in the treatment of locomotor ataxy. To-day these remedies are coming into their own, and I have no hesitation in subscribing to the view that this disease, in its early stages at any rate, can be checked and held in check by repeated courses of mercury, or of the arsenical compounds, or by a judicious combination of these metals. Let me choose two out of a large number of cases which illustrate this principle, each serving to emphasise a point of clinical importance.

CASE 4.—In October, 1912, nearly 14 years ago, a young man consulted me about pains in his limbs from which he had suffered for four years and which had been regarded and treated as due to neuritis. A detailed description of his pains convinced me that they were the lightning pains of tabes dorsalis which, in my opinion, have features dis-

tinguishing them from pains of other origin. Examination revealed no sign of any organic disease with the single exception that his appreciation of painful stimulation below the knees, on the inner side of his forearms, and on parts of his thorax was slightly less acute than the normal. A history was elicited of a venereal sore seven years previously, for which he had been treated for a month, and the Wassermann reaction of his blood was found to be positive. This patient is to-day a perfectly healthy man who would certainly pass as a first-class life for insurance just as he passed A1 for the army during the war. In the interval he has married, and is now the father of two healthy children. He is a scratch golf player and works very hard at his business, often with insufficient holiday. There can be little doubt that he owes his maintenance of good health to the fact that from the day he came to see me he has never allowed more than a few months to elapse without a course of antisyphilitic treatment, mercurial inunctions varied by an occasional series of injections of novarsenobenzol. May I add that, although the Wassermann reaction has been taken from time to time with varying results, these tests have never been allowed to influence the incidence or character of his treatment.

CASE 5.—In April, 1908, I was consulted by a man of 51 years of age on account of lightning pains and some difficulty with vision. He presented unequal Argyll Robertson pupils, normal discs, slight relative analgesia over the skin of his legs, very sluggish knee-jerks, and complete absence of ankle-jerks. Although not in any way ataxic, the postural sensibility in his toes was not up to normal standard. It is interesting to note that this patient is a watchmaker and spends many hours a day doing fine work necessitating a considerable strain on his vision. He is still doing this work to-day and his physical signs have not altered. During the 18 years he has been under my care he has had courses of mercury at frequent intervals and occasional courses of potassium iodide.

The first of these two patients has been referred to in order that emphasis may be laid on the possibility of making a diagnosis of tabes from the character of lightning pains before the development of physical signs, and on the success attending early and repeated treatment over a long period of years. The story of the second patient has been recorded with the object of showing that mercury and potassium iodide, if their administration is persevered with, may still be relied upon to hold in check the ravages of syphilis on the central nervous system.

The principles governing the treatment of syphilis of the nervous system do not really differ from those governing the treatment of syphilis of other organs, but in view of the value as well as of the delicacy of nervous tissues the importance of early diagnosis cannot be too strongly urged. If any real advance is to be made in the war against syphilis, it must depend on our having the moral courage to confess to our patients that we are unable to recognise any permanent cure for the disease. I am convinced that if this policy had been adopted when it should have been thousands of lives would have been spared and untold masses of suffering avoided.

DISSEMINATED SCLEROSIS.

Disseminated sclerosis has been chosen for very brief consideration in close proximity to syphilis of the nervous system because the two conditions possess many clinical features in common. In both instances the central nervous system is liable to attacks on its integrity which are not in any way regulated as regards time or place. In both we meet with remissions and relapses, but in the case of disseminated sclerosis, recognising as we do the remarkable powers of recovery exercised by Nature alone, it is a matter of great difficulty to estimate the value of any remedial agents we employ. Nevertheless, I have held the view for a long time, and I am not yet prepared to abandon it, that if the principles governing the treatment of syphilis are applied to the treatment of disseminated sclerosis, in spite of our ignorance of its causal agent, the results are often too striking to be disregarded or attributed entirely to the action of chance. Arsenic and mercury are employed more and more frequently in the treatment of this disease, but success, as in the case of syphilis, is mainly dependent on early diagnosis and on the indefinitely continued administration of the two metals just mentioned.

I cannot do better than cite a single case in support of the view that the repeated administration of arsenic, whether by mouth or through the skin, does exercise a beneficial influence on the course of the disease.

CASE 6.—In April, 1912, a girl of 17 complained to me that a fortnight before our interview she experienced pins and needles in her right leg followed shortly by a sudden failure of power in her left leg. Three days later her left arm was numb and cold up to the elbow and she suffered from slight headache. On examination, I found the right disc hyperæmic with blurring of its edges. Both hands were lacking in postural sensibility and the left was almost completely astereognostic. The abdominal reflexes were absent on the left side and sluggish on the right. The left leg was spastic with ankle-clonus and extensor response. The power of the right leg was good, but its tactile and painful sensibility was diminished. Her gait was very ataxic.

On my advice she took arsenic in the form of Fowler's solution for three weeks out of every four, and when I saw her next six months later she expressed herself as being as well and as active as before her illness. Her only physical signs then were slight temporal pallor of the right disc, left knee- and ankle-jerks more brisk than right, and an indefinite extensor response in the left foot.

When I saw her next in June, 1914, she was perfectly well and I could find no abnormal physical signs. About two years later she began to neglect her arsenic, and in December, 1917, she came to me complaining that her left leg was weak. Examination showed that the left abdominal reflex was absent and the left plantar response extensor in type. The resumption of arsenic was followed by benefit, and in January, 1918, I could find no physical signs. Six months later she married, and in August, 1920, a healthy child was born. The arsenic was again neglected, and in January, 1922, she developed sensory disturbances in her left leg and loss of power in the right. She was put through a course of intramuscular injections of glucarsenol and made a complete recovery. When I last saw her in July, 1924, she was perfectly well and leading a normal active life.

This story may be summarised in a few words. A girl of 17 was crippled by patches of disseminated sclerosis in April, 1912. In July, 1924—12 years later—after experiencing some vicissitudes and taking a great deal of arsenic, she was an active and apparently normal married woman with a healthy child 4 years of age. I am sceptical enough not to be convinced by this story that arsenic has specific powers in combating the disease we call "disseminated sclerosis," but a long experience of its effect in such cases leads me to think that if used early and persevered with it is the best weapon we can employ.

CONCLUSION.

In the course of this, my second, lecture I have discussed the treatment of epilepsy, syphilis of the nervous system, and disseminated sclerosis, and have endeavoured to lay emphasis on two principles which are of outstanding importance if any measure of success is to be attained. The first of these is early diagnosis associated with a frank recognition of the fact that preventive measures must be our mainstay in the struggle against the diseases under review. The second principle is that of taking our courage in both hands and, in spite of the public demand for rapid cures, insisting on regulated treatment over long, perhaps indefinitely long, periods of time. Our knowledge of the natural history of these diseases does not permit us to shirk this responsibility or to take a line of less resistance.

GLASGOW HOSPITALS.—The annual report of Glasgow Royal Infirmary states that during 1925 more than 70,000 persons in all received attention; this was 4212 more than in the previous year. There were over 55,000 out-patients, an increase exceeding 10 per cent. The average period of residence was 18·2 days, as compared with 19, and the average cost of each patient £7 10*s.*, a fall of 7*s.* 9½*d.* In 1899 the average residence was 31 days. The managers are increasingly anxious to relieve pressure and hasten convalescence by establishing a country annexe.—The annual report of Glasgow Victoria Infirmary announces that the governors have purchased 30 acres of land for the establishment of a country auxiliary, and that an early start will be made with the first section. There will be accommodation for 50 patients, and towards the cost of £50,000 Mr. W. Gilchrist-Macbeth has given £20,000.

THE GORILLA AND MAN AS CONTRASTED FORMS.

Being the Abstract of a Hunterian Lecture given in the Royal College of Surgeons of England on Feb. 26th, 1926,

BY SIR ARTHUR KEITH, M.D.ABERD., F.R.S.,
CONSERVATOR OF THE MUSEUM.

THE history of the gorilla, which in a structural sense is man's nearest living relative, is closely linked with the Museum of the Royal College of Surgeons. The first description of the gorilla's skull was given in 1848 by Sir Richard Owen, who was then conservator of the Museum. That master-anatomist was impressed by the resemblance of the skull of the new anthropoid to that of the chimpanzee and came to the conclusion that the gorilla was in reality a highly differentiated species of chimpanzee. Although it is true that the adult males of one breed of chimpanzee may closely resemble the immature male gorilla and also the adult female, yet the expert eye has no difficulty in distinguishing between them. Hence, since Owen's time, anatomists have agreed to raise the gorilla to a separate generic rank. Another link which binds the Museum of the College to the early history of the gorilla is its possession of the first skeleton brought to Europe; Sir Richard Owen acquired it from Captain Harris in 1851. Lately several valuable additions have been made to the gorilla collection of the Museum. The African traveller, Mr. F. W. H. Migeod, had presented the skulls of two adult males obtained in that part of West Africa where the French Cameroons marches with British Nigeria, but on the French side of the frontier. These are the "furthest north" gorilla skulls which have come from Africa. Through Lieut.-Colonel R. H. Elliot the College have obtained skulls of that peculiar breed of gorillas which live in the mountainous regions between Lake Tanganyika on the south and Lake Edward on the north, and was first made known from the region of Lake Kivu by a German engineer in 1902, and hence is known as the Kivu gorilla. Colonel Elliot's specimens, one the skull of a gigantic male, the other that of a youth, come from the Congo frontier of Uganda and are the "furthest East" specimens which have come to Europe. Another African traveller, Captain J. E. T. Philipps, has collected a series of Kivu skulls in the south-western corner of the Uganda Protectorate, which have been presented to the Natural History Museum, South Kensington; the lecturer has been given free opportunities of examining Captain Philipps's specimens and of comparing them with those in the Museum of the College. The most valuable addition to the gorilla series of the Museum, however, has been made by the President of the College, Sir John Bland-Sutton. He acquired and presented a series of skulls and skeletons, collected in the Cameroons, to illustrate the remarkable growth and age changes which the gorilla passes through in its passage from youth to old age.

Distribution of the Gorilla.

Thus the homeland of the gorilla extends across equatorial Africa from Nigeria in the West to Uganda in the East, a stretch of 1500 miles. But although the gorilla homeland is wide, its population is represented only by scattered and small family bands; from accounts furnished by travellers and hunters, one infers that the total population—males, females, and young—is well under 10,000. Spread over so wide a space one would expect to find well-differentiated local breeds or even species. There are only two breeds or races—the highland or Kivu race and the lowland or Gaboon race. The highlander lives on the brush and thickets which clothe the gullies and steep sides of his native mountains. The climate of his homeland, although on the equator, is wet, cloudy, and bleak; the Kivu gorilla lives at an altitude about 10,000 ft. above sea-level. Hence the highlander is provided with a longer and denser coat of hair than his lowland cousin. So distinctive are these two breeds—the highland and lowland—in external appearances that one expected to find differential marks in their skulls, and yet a prolonged search has failed to reveal any constant point of structural difference. It is true that the highlander is usually the larger and stronger animal; a male shot by Mr. Carl Akeley weighed 32 st. (205 kilos); the skull presented by Colonel Elliot has larger teeth and jaws than has ever been seen in a lowland form, yet among the highland skulls collected by Captain Philipps some are not above the lowland standard. One distinction is almost constant in the symphysis of the lower jaw of the Kivu gorilla. The genioglossus muscles of apes arise from a pit behind the symphysis. In the lowland gorilla this pit is usually large, in the highland gorilla it is usually filled up by bone, as is the case in all recent races of mankind.

Although the failure to find any constant anatomical difference between the lowland and highland races of gorilla may upset the systematic zoologist, it is of the greatest interest to the student of human races. For he is familiar with the fact that men of the same race show an extraordinary variability in their facial features, and also in colour of skin and hair. Such a variability is usually explained as being due to a mixture of race; amongst gorillas the degree of variability is even greater, but amongst them there can be no suggestion of mixture of race. In both cases the degree of variability may be taken as evidence of an evolutionary plasticity. For on the evidence provided by geology we may presume that man and the gorilla are both evolving, but in opposite directions, the one towards brain, the other towards brawn.

The Gorilla's Gait.

Both Lamarck (1809) and Darwin (1871) supposed that if an anthropoid ape became, either from choice or necessity, a ground-living form it would, in the course of generations, acquire a human gait. A little reflection will convince anyone that an animal weighing 30 st., such as the male gorilla, must be a clumsy climber; its flight would be limited to such trees and branches as could carry so great a weight. Mere weight compels the adult male to a life on the ground. From the accounts which have come home from hunters and travellers we now know that gorillas are, particularly the adult males, ground-living forms, and apparently have been such for many a generation. Yet the gorilla still walks with a forward slant in his body, supporting and balancing his weight on his bent knuckles as he advances. His feet, it is true, have advanced nearer to a human shape than those of any other known ape. The essential structural characteristic of the human foot is the relatively great size and length of its tarsal element and the relative shortness of the outer four digits. In this respect the gorilla's foot stands intermediate to that of the chimpanzee and of the human child.[1] And yet the great toe of the gorilla can be, and is, used as a grasping thumb. Recently an animated discussion took place in the pages of *Nature* (Sept. 24th, 1923, et seq.) between Sir E. Ray Lankester and Dr. W. K. Gregory, of the American Museum of Natural History, as to whether or not a cast of the foot of a Kivu gorilla, which showed the great toe in alignment with the other toes, as in the human foot, could be regarded as a true or natural representation of the position of this digit. Both abducted and adducted positions are natural for the great toe of the gorilla; when the animal scrambles in thickets of bamboo in search of its favourite food—young bamboo shoots—it uses its foot as a grasping organ; when it waddles along the glades which intersect the undergrowth of its native jungle the foot is used as a supporting and propelling structure. The great toe falls into alignment with the other toes and becomes the chief point from

[1] See Keith: Evolution of Man's Posture, Brit. Med. Jour., 1923, i., 670.

which the forward impetus is obtained. Flexion lines, corresponding to those of the gorilla's foot, are to be seen on the sole of every newly-born child. Dr. T. Brushfield has recently recorded their presence in the feet of mongolian idiots of juvenile age. A strict comparison of the structural characters of the feet of man, the gorilla, and the chimpanzee, leaves the anatomist convinced that the human foot, in the course of its final evolution, passed through a gorilline stage.

The Affinities of the Gorilla to Man.

This conviction is strengthened by certain other anatomical features of the gorilla's body. In early days of the Darwinian struggle opponents of the evolutionary theory laid much stress on the fact that man had a special muscle—the peroneus tertius—for raising the outer border of his foot, and that the muscle was his peculiar possession. We now know that the peroneus tertius is not constant in human anatomy; if a hundred bodies are dissected there will likely be five in which this muscle has not been separated from the long extensor of the toes, and ten in which the separation is only partial. European anatomists have known for many years that partial attempts to form a peroneus tertius do occasionally occur in the gorilla, but in only one case has a fully differentiated muscle been found. Recently, however, Dr. Dudley Morton,[2] on dissecting two gorillas, one of which belonged to the Kivu breed, found this muscle differentiated in both animals. It is difficult to think that the tendency to produce this muscle has arisen independently in two forms which are so near akin in structure and origin as man and the gorilla; one cannot conceive that using the foot in a plantigrade position would cause the outer part of the long extensor of the toes to split away from the rest and bring about a migration of the tendon of the separated part backwards along the outer border of the foot. What causes such useful variations to arise we do not know, but the tendency to produce the one in question is found in only man and the gorilla, and points to an inheritance from a common ancestor.

Such an intimate structural resemblance between man and the gorilla does not stand alone. In lower primates the origin of the soleus muscles of the calf of the leg is confined to the fibula; in man this origin has been extended to the whole length of the oblique line of the tibia. A tibial extension is to be found in 35 per cent. of gorillas and in a lesser percentage of chimpanzees. The extensor brevis pollicis is another muscle which has not become firmly fixed in man's body; it has arisen by the separation of part of the extensor ossis metacarpi pollicis; in 6 per cent. of white men and in a larger percentage of negroes this muscle, which was regarded as peculiar to humanity, remains undifferentiated or only partly separated. The only other animal which shows a tendency to produce this muscle is the gorilla; a representation of it is found in 20 per cent. of the animals dissected. On the inner side of man's upper arm is found the fibrous remnant of a climbing muscle—the latissimo-condyloideus; in 5 per cent. of human bodies muscle-fibres occur in this remnant. The latissimo-condyloideus is more reduced in the gorilla than in any other anthropoid; in 20 per cent. of dissections the muscle is represented, as in man, by fibrous tissue only. When we take into consideration these intimate resemblances between man and the gorilla, and keep in mind that this anthropoid makes a nearer approach in size and pattern of brain to that of man than any other known animal, the conviction is forced home that the gorilla has come by a larger share of man's inheritance than any other ape. In this matter the gorilla's cousin, the chimpanzee, is his nearest rival.

The Trend of Evolution in the Gorilla Contrasted with that in Man.

The brain of man forms the climax of an ascending series. Between the stage represented by the brain of the marmoset and that exemplified by the gorilla a series could be chosen which would exemplify every grade of evolution. The skull of the adult male Kivu gorilla obtained by Colonel Elliot has a capacity of 620 c.cm.; some are known in which the capacity reaches 650 c.cm. Between the highest gorilla and the lowest human brain we know as yet only one intermediate stage—that represented by the brain of Pithecanthropus, and in size and pattern this brain has reached almost, if not quite, the threshold of humanity. The point of brain development reached by the human brain marks the furthest point attained by any primate, but in weight of body, in volume of lung, in size of tooth, massiveness of jaw, and strength of muscles—particularly those of mastication—the gorilla crowns the primate series. We have found no fossil remnant of any anthropoid which was so massively developed as is the gorilla. And yet at birth the gorilla is smaller (under 5 lb. in weight) than the new-born child, and is just as nude and helpless. Its skull is as rounded and smooth as that of a human infant, and the muscles of mastication are no larger. The temporal muscles, for example, start from the same base line on the sides of the skulls of the gorilla, chimpanzee, and man, but whereas the temporal muscles of the gorilla extend their origin until great bony crests are formed along the vault of the skull, those of the chimpanzee and of man stop short of such an extreme. In man the temporal muscles are arrested in their ascent at a stage corresponding to that reached by the gorilla in youth; in the chimpanzee these muscles become arrested at a point reached by the gorilla in early adolescence. In man the evolutionary tendency has been to retain more and more the structural characters of youth; in the gorilla the tendency has been in the opposite direction—to increase the size of jaw and strength of body. In his evolutionary career man has moved in the direction of brain, while his cousin the gorilla has moved in the direction of brawn. The evolutionary process which has produced such diverse forms from a common ancestor constitutes at once the most enigmatical and also the most interesting experiment to be found in the whole realm of Nature.

The Machinery of Evolution.

Dr. W. A. Freund,[3] in 1872, when describing a patient, who, as we now know, was the subject of acromegaly, was struck by the fact that the structural changes to be seen in the body of his patient were anthropoidal in character. Dr. Harry Campbell in 1894, when the relationship of acromegaly to a disordered action of the pituitary gland was beginning to be recognised, observed that men and women who became the subjects of acromegaly underwent growth changes which were similar in nature to those which occur in the maturing phases of the gorilla. He was inclined then to explain acromegaly in man as an atavism or reversion to an ancestral or evolutionary stage—one which is now represented in the bodies of gorillas. It seems more legitimate, in the present state of our knowledge of the action of hormones on the growth of the body, to regard gorilline characters, whether they occur as a normal manifestation in the life-history of the gorilla or as an abnormal manifestation in the life-history of the acromegalic, as being due to an increased action of that element of the pituitary gland which influences the processes of growth. Those who oppose such an explanation on the grounds that no proof has been adduced that the pituitary gland of the gorilla is exceptionally large, forget that our recognition of pituitary influence cannot be inferred from the size of the pituitary gland. The pituitary is a complex body producing many substances, some of which subserve immediate physiological purposes; others can somehow stimulate and regulate the growth of diverse anatomical systems of the body. The anatomist cannot assess the functional potentiality of a pituitary gland by the crude use of scales or microscope.

[2] Anat. Rec., 1924, xxvii., 323.

[3] See Keith: The Nature of the Skeletal Changes in Acromegaly, THE LANCET, April 15th, 1911; Progeria and Atelelosis, Ibid., Feb. 1st, 1913.

There is an infinitely more delicate method. The pharmacologist recognises the presence or absence of one element secreted by the pituitary gland by its influence on the contraction of non-striated muscle. The clinician recognises the action of another element formed by the pituitary gland by its influence on the growth of the muscular, bony, and alimentary systems of the living body; he discovered these effects by the study of cases where the action of the pituitary becomes disordered as in the subjects of acromegaly. It is just those systems which undergo so great a degree of increase during the later stages of growth of the gorilla. We may therefore legitimately infer that, in the evolution of the gorilla, the pituitary has played a prepotent part. The evidence, as it stands, is enough to justify the student of man and ape in believing that he has obtained a real glimpse into the machinery of evolution.

ASSOCIATED ORGANISMS CAUSING EMPYEMA.

BY H. E. A. BOLDERO, D.M. OXF., M.R.C.P. LOND.,
ASSISTANT PHYSICIAN, MIDDLESEX HOSPITAL; PHYSICIAN, EVELINA HOSPITAL;
AND
L. E. H. WHITBY, *M.C.*, M.B., B.CH. CAMB.,
ASSISTANT PATHOLOGIST, MIDDLESEX HOSPITAL.

INTEREST in the following case of empyema lies chiefly in the fact that two organisms were associated in its production; the one a mycelium, and the other a pneumococcus. Alone neither was pathogenic to guinea-pigs, but in association they always produced lesions. Clinically, the striking feature of the case was its chronicity. Probably the start of the empyema can be dated from an "attack of pneumonia," which occurred five months before the patient came under observation. He was in the ward for a further three months, and during that time was never urgently ill, nor did he show marked signs of toxæmia.

Clinical History.

The patient was a man, aged 19, admitted to the Middlesex Hospital under Dr. C. E. Lakin in February, 1924. In the history there is little to note. As a child he made a good recovery from an attack of measles, and was free from any illness until September, 1923. In September, 1923, he had "pneumonia" at home, from which he "improved very slowly," his cough and expectoration persisting until admission. On admission the patient looked pale and seedy, but was not urgently ill. He was more comfortable lying on his left side. The temperature chart showed very slight irregular fever in the neighbourhood of 99° F., while the pulse-rate varied between 90 and 100. Slight clubbing of the fingers only was present. There was no cyanosis or respiratory embarrassment. His cough was only troublesome at intervals, and the sputum was muco-purulent, greenish in tinge, and did not exceed 2–3 oz. a day. Typical signs of empyema in the left pleural cavity were found, the heart's apex beat being 2¼ inches from the mid-sternal line. X ray examination confirmed the clinical findings. With an exploring needle a few c.cm. of pus were withdrawn. It was thick and of a greenish-yellow tint. One of us (L. E. H. W.) examined this pus and found the predominating organism to be a mycelium, but there were also present a few pneumococci. The patient's blood showed a leucocytosis of 22,500 per c.mm., of which 68 per cent. were polymorphonuclear cells. The Wassermann reaction was negative, so also was the tuberculous complement-fixation test. The sputum contained neither tubercle bacilli nor any mycelium.

Aspiration was decided upon, and 17 oz. of pus were removed. The patient improved rapidly, putting on 8 lb. in weight during the following week. The physical signs at the left base showed that the fluid was clearing, particularly behind, near the spine. After two or three weeks, however, little change was appreciated in the physical signs, for the absence of breath sounds and the marked dullness on percussion (more particularly in the left lower axillary region) persisted. The apex beat was now 3¼ inches from the mid-sternal line. Rib resection was not undertaken as the patient's general condition continued to improve. He was given small doses of potassium iodide three times a day for six weeks.

The sputum, having been examined regularly, was found three weeks after aspiration to contain a mycelium apparently identical with that obtained from the pleural cavity. It is to be noted that the sputum had not increased in quantity nor changed in naked-eye appearance. Further progress was slow and uneventful, and the patient was discharged in May, 1924. When next seen in August he said he was "feeling well," and the physical signs showed no evidence of fluid, but the air entry into the left lower lobe was still very poor. His fingers showed the same slight degree of clubbing.

Over a year later, in October, 1925, in response to a query, he wrote: "I have not required any medicine since October, 1924, and have been at work since January, and feel very well—in fact, better than before my illness."

Bacteriological Findings.—The specimen of pus aspirated from the pleural cavity was thick and of a greenish-yellow colour. Careful search failed to reveal any of the macroscopic sulphur-yellow "granules" characteristic of true actinomycotic infections. In stained films of the pus the predominant organism was found to be a mycelium the threads of which were often of considerable length, many of them showing segmentation of the protoplasm and the presence of the so-called "spores"; but neither branching of the mycelium nor clubbing of the ends could be observed. A few encapsuled pneumococci were also present. In culture the mycelium grew in about a week under aerobic conditions on ordinary agar, the colonies being small, opaque, and difficult to pick off with the needle. The threads in culture were shorter, thicker, and more bacillary in form than those in the original specimen. Neither the original mycelium nor the culture was acid-fast.

With a view to testing the pathogenicity of the organisms, three guinea-pigs were inoculated subcutaneously with 2 c.cm. of the undiluted pus. Within a week all three animals had developed at the site of the inoculation hard subcutaneous inflammatory masses, about the size of a half-crown. There was no glandular enlargement. A post-mortem examination on one of these animals showed considerable subcutaneous œdema with slight hæmorrhages at the site of inoculation, and a small abscess cavity containing no organisms in films or cultures. Some of the tissue from this animal was macerated in saline and inoculated into a further guinea-pig, but failed to produce any lesion. The two other animals of this series were allowed to live and in three weeks had entirely recovered; when finally they were killed, at the end of six months, no tuberculous lesions were found. A further guinea-pig was inoculated subcutaneously with 2 c.cm. of a fresh specimen of the pus, and in ten days had developed a discharging sinus, the discharge containing a few mycelial threads, but no pneumococci. This finding was verified by culture. Sections of the skin and subcutaneous tissue from this animal showed much inflammatory reaction with the presence of occasional mycelial threads.

As experiments with the original specimen showed that lesions could be produced in the guinea-pig, it was decided to try the effect of inoculation with pure cultures. A further series of three guinea-pigs was inoculated subcutaneously as follows: (1) with 2 c.cm. of a strong emulsion of the pure mycelium; (2) with 2 c.cm. of a strong emulsion of the pure pneumococcus; (3) with 2 c.cm. of a mixture of the two emulsions in equal parts. Of these animals, the last-named only developed a hard subcutaneous inflammatory mass, similar to that produced in the animals inoculated with the original specimen of pus. The lesion was most marked on the tenth day and had entirely subsided at the end of three weeks. The other two animals showed no lesion at all. The experiment was repeated on a further series of these animals with the same result, except that the lesion was extremely small and had disappeared in a fortnight. The pathogenicity of the pneumococcus was tested on a mouse by the intraperitoneal inoculation of an agar slope of the pneumococcal culture. The animal survived the inoculation and showed no sign of illness at any time.

Conclusions.

The result of the animal experiments indicates that the two organisms—mycelium and pneumococcus—when associated together were capable of producing lesions, but that when separate they were incapable of so doing. There was no suggestion throughout the entire investigation that the mycelium should be classed with the streptothrix actinomyces as described by Homer Wright.[1] The mycelium had the characters, both morphological and cultural,

[1] Biology of the Micro-organism of Actinomycosis, Jour. of Med. Research, 1904.

of the organism of Boskröm, usually regarded as a secondary and non-pathogenic invader from the mouth. In this patient the empyema was probably pneumococcal in origin, as he had "pneumonia" five months before admission to hospital. It would seem logical to infer that the empyema tended to be more chronic and stubborn owing to the superadded infection with the mycelium—probably arising from the mouth. In these circumstances aerobic oral mycelia can hardly be regarded as entirely non-pathogenic.

Symbiosis of micro-organisms is a well-recognised fact. The organisms of gas gangrene thrive well in a wound infected also with pyogenic cocci. The *B. influenzæ* (Pfeiffer) is considerably assisted by the presence of concomitant staphylococci and pneumococci. Again, the streptococcus has been shown by Gaté Papacostas and Billa [2] to increase the toxin production of the diphtheria bacillus. In our case we are justified in assuming that an originally non-pathogenic mycelium was capable of pathogenicity when associated with a pneumococcus—even though the latter had apparently become avirulent.

We are indebted to Dr. Lakin for his kindness in allowing us to publish this case.

ENCEPHALITIS FOLLOWING OPERATIONS ON THE TEMPORAL BONE.

BY J. ARNOLD JONES, O.B.E., M.B. MANCH., F.R.C.S. EDIN.,

SURGEON, ST. JOHN'S HOSPITAL OF MANCHESTER AND SALFORD FOR DISEASES OF THE EAR; SURGEON-IN-CHARGE, NOSE, THROAT AND EAR DEPARTMENT, ROYAL MANCHESTER CHILDREN'S HOSPITAL.

ENCEPHALITIS resulting from an operation on the temporal bone must be a very rare condition, as a search through literature discovers no references. Two such cases have occurred within my own experience, the first under Mr. Macleod Yearsley when I was house surgeon to the Royal Ear Hospital, and reported by me in THE LANCET, 1906; the second, a private patient on whom I performed a radical mastoid operation in September, 1922. As regards the first case, it suffices to say that although the encephalitis was the predominant complication, it was accompanied by an abscess in the temporo-sphenoidal region; that the patient was in a condition of acute maniacal delirium for over three weeks; that a large hernia cerebri developed and that recovery eventually took place.

In the second case encephalitis alone was present, the symptoms were much less severe than in the first, and complete recovery took place. The history of this case is as follows.

Mr. A, aged 38, consulted me in regard to a chronic discharge from the right ear of over 25 years' standing; deafness was also complained of. On examination almost total destruction of the drum and ossicles was observed, together with the presence of much tenacious pus and debris; no pain or tenderness was present.

Operation.—On Sept. 19th, 1922, I performed a radical mastoid operation. The antrum and middle ear were full of pus and cholesteatomata; the bony roofs of both cavities were missing. On closer examination it was found that while the meninges formed a roof to the tympanic cavity they were missing from over the antrum, and brain tissue was actually protruding into that cavity in fair quantity. The operation was performed on the usual lines and all cholesteatomatous and septic material was thoroughly removed from the antro-tympanic cavity. A meatal flap was formed and the cavity packed with gauze soaked in iodoform emulsion. The post-aural incision was sutured. The night of operation the temperature rose to 101° F., but was normal next morning and remained so until the fifth day. During this period the patient's general condition was quite satisfactory and he complained of no local pain or headache. The nurses thought that occasionally "he seemed a little bit queer" mentally. On the fourth day the first dressing was done and everything found perfectly satisfactory. On the evening of the fifth day the temperature rose to 100° and he was restless. Next morning the temperature remained at 100°, and he was very mildly delirious, but complained of no pain or headache. On the evening of the sixth day the temperature rose to 102·4° and he was definitely delirious and restless; bromides were given. From now until the twenty-eighth day the temperature varied from 100° to 103·6° with an occasional drop to 99°. The pulse, which was 74 before operation, varied from 60 to 80, while respirations, usually 24, never reached higher than 28. He only complained of headache three times, but it was apparently not severe in degree. He vomited twice, on the seventh and the twenty-eighth days. During the whole period from the fifth to the twenty-eighth day he was more or less delirious, usually mildly so during the day, more markedly so at night, when he had to be controlled by drugs, but his condition never passed into that of stupor. At no time was there rigidity of the neck muscles, nor was Kernig's sign ever present. The local condition was always satisfactory. The post-aural incision healed by first intention. Packing the antro-tympanic cavity was discontinued on the eighteenth day, and subsequently a daily toilet was performed, consisting of syringing the cavity with boric lotion and afterwards instilling 50 per cent. spirit lotion. On the twenty-ninth day he left the nursing home and passed under the care of his own medical adviser.

I next saw him on Dec. 19th, 1922—i.e., about two months later—and found him in a very satisfactory condition. He was in perfect health and the antro-tympanic cavity was dry and completely lined with white shining epithelium.

The diagnosis of encephalitis was made because the symptoms did not fit in with any other intracranial complication, and because the presence of brain tissue in the antrum obviously lent itself to injury or infection. The symptoms which characterise simple uncomplicated encephalitis would, therefore, appear to be pyrexia of some weeks' duration accompanied by delirium more or less marked. The patient at no time appears very ill. The prognosis would appear to be good. If other complications arise, as in the first case referred to, in which a temporo-sphenoidal abscess was present, other and more serious symptoms will appear. Post-operative encephalitis of this type can only arise when the brain tissue itself has been injured. In my experience this has happened on two occasions, in both of which chronic mastoid disease had destroyed not only the bony roof of the antrum but also the meningeal covering of the brain, allowing the substance of the latter to project into the antral cavity.

It is extremely difficult in these cases to remove the septic contents of the antrum without damaging the brain tissue to some extent, and the degree of encephalitis that follows seems to me to depend upon two factors: (1) the amount of trauma inflicted on brain tissue; (2) the thoroughness with which the antro-tympanic cavity is cleared from infective material. The accomplishment of this latter object is much facilitated by the use of properly made iodoform emulsion used as a dressing.

[2] Bull. Soc. de Sci. Méd. et Biol. de Montpellier, 1921–22, iii., 478.

A SCHOOL FOR MYOPES.—Mrs. Bridge, B.A. Lond., formerly principal of a school in Brighton, has opened a school for myopes at the Manor House, Piltdown, near Newick and Uckfield, Sussex. The aim of the school is to educate children with defective eyesight. The teaching is largely oral, and practical and concrete methods are adopted wherever possible. Much time is spent in the open air and sedentary work is reduced to a minimum. The schoolroom is specially built for the purpose and suitably fitted. The special desks used in the L.C.C. myope schools are used. The curriculum includes dancing, eurythmics, musical appreciation, and certain handicrafts, beside the usual English subjects and French. Advantage is taken of the wireless and of good gramophone records. Outdoor occupations and interests, such as gardening, poultry keeping, pets, &c., and simple home duties, alternate with the ordinary lessons, so that the time which may not be spent in reading is both usefully and happily occupied. At present only ten children can be received. They share the home life of the principal's own children, on whose account she first made a study of the need of special education for myopes.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF UROLOGY.

AT a meeting of this Section held on Feb. 25th, Mr. R. H. JOCELYN SWAN, the President, being in the chair, Prof. HUGH MACLEAN read a paper on the

TESTING OF RENAL FUNCTION

in relation to the treatment of renal disease. It was important, he said, to reduce the number of tests to a minimum, and all necessary information could be gained from the estimation of the blood-urea and the urea concentration in the urine. The blood-urea was variable; 20 mg. was about the normal for young people, but it might reach 80 mg. in healthy people past middle life. Many conditions other than kidney trouble could increase it, and alone it was unreliable, except that if it were normal the kidneys could not be in a very bad state. The water test, extensively used in America, gave much trouble to the patient but no more information to the doctor. The simplest test of all was to starve the patient of fluid from 15–20 hours and then estimate the urea in the urine by the hypobromite method.

Albuminuria and Hæmaturia.—Albuminuria was common; it hardly ever led to nephritis in children. The patient was usually a bit overgrown and neurotic and the urine showed no casts. In such a case the albuminuria meant nothing. Adults might have albuminuria and even casts without any symptoms of disease and with repeatedly normal readings in the urea tests. Another type of patient passed albumin, casts, and blood, and definitely had something wrong, probably a mild attack of acute nephritis. Recovered cases of nephritis might improve in their urea concentration from 1·3 to 4 or 4·5 per cent. and still have some albuminuria. Continuance of the albuminuria was, therefore, no indication that the kidney was passing into the chronic condition. Some perfectly healthy people continued to pass albumin for 20 or 30 years after an attack of scarlet fever. It was important to examine the centrifugalised deposit. He cited the case of a small boy with curious attacks of pallor, pain, and some difficulty of micturition. There was no evidence of nephritis, but the centrifugalised deposit of his urine was full of cystin crystals.

High Blood Pressure and Nephritis.—Boys of 16 to 19 often passed a little albumin and had a blood pressure of 155/80. In most of these cases there were no subsequent developments. Many healthy people had abnormally high blood pressures without symptoms of ill-health. If the kidneys got involved when the high pressure occurred with arteriosclerotic changes, the end was not far off, but they often escaped, even when the veins of the arm were twisted and swollen.

Treatment.—Nothing much could be done in acute or chronic nephritis, said Prof. MacLean, except to put the kidneys under the best possible conditions. The patient should be kept warm and given glucose by the mouth. Many who could not drink milk could take a 50 per cent. solution of glucose, which passed so quickly into the intestine that a certain amount was retained even if the patient vomited. Diuretics were of no use; there was already an excessive amount of urea, which was the best diuretic known. In the parenchymatous type, where the patient had a tremendous œdema and was passing protein in the urine, a good solid diet with plenty of protein was beneficial. 80–100 g. doses of urea sometimes promoted diuresis, which very often hung suspended on a trigger and was released by most unexpected factors. Baths were sometimes helpful, and nicking with a knife was better than Southey's tubes. There was no evidence that protein did any harm whatever. Animal experiments showed that a rabbit would not develop nephritis even on a diet containing 70 per cent. of protein if it were also given green vegetables in minute amounts. It was better to reduce the protein in very acute nephritis, but in advanced chronic cases it did not matter. It was wrong to interfere with a high blood pressure; the body became accustomed to it and the patient was better left alone, unless it was causing definite symptoms.

Discussion.

Sir THOMAS HORDER said that he was unable to believe in the wisdom of reducing the tests of renal function to a minimum. The condition of nephritis was so complex, being possibly not a disease at all but a general metabolic disturbance which produced kidney changes amongst other effects, that we might be "caught out" if we reduced the tests of a single organ to a minimum. It was premature to say which were the best tests. The significance of casts depended on the criterion of the examination. He had given up attaching importance to casts found after careful examination of a centrifugalised deposit. In many cases nephritis progressed very slowly indeed, if the patient escaped secondary infections like subinfection of the alimentary tract, mild sore-throat, coryza, &c. Acute nephritis was very often an exacerbation of the kidney condition due to such infection. A scarred kidney revealed only by albuminuria was not uncommon. The present generation tended to hustle their renal cases too much or to be disappointed too soon; in the old days renal patients were carefully nursed for months. Sometimes decapsulation would start a diuresis which, once obtained, might go on. Possibly the recovery obtained in chosen cases might be due less to the actual decapsulation than to the escape of fluid by the incision, and other operative procedures might do as well. He agreed with Prof. MacLean about the diet in chronic cases. There was as yet no rational pathogenesis of nephritis; how, therefore, could there be a satisfactory therapeusis?

Sir JOHN THOMSON-WALKER dealt with the surgical side of the problem, which was largely concerned with cases of enlarged prostate, and in 80 per cent. of cases dealt with a temporary condition where the renal function would be almost entirely recovered in ten days with proper treatment. He had always suspected that the good effect of decapsulation in œdematous cases was due to the incisions. He agreed with the desirability of reducing the tests, and believed in the urea tests as opposed to the colour tests—viz., phenolphthalein and indigo-carmine. The urea-concentration test forced the kidney to work up to its highest power, which was what the surgeon wanted to know. The decision for or against operation depended on: (1) The ability of the surgeon to avoid complications; if a patient with a low urea function got bronchitis, hæmorrhage or a little temperature it would be sufficient to kill him. (2) The surroundings of the patient and the experience of the nurse. The blood-urea was only a guide where half the kidney tissue was destroyed, and it gave a good idea of the progress of a case. He had no faith in renal indices; he wanted to know how much blood-urea there was and what the kidney could be forced to eliminate.

Sir WILLIAM WILLCOX agreed that the two urea tests were the most important, but pleaded for the estimation of the chlorides in urine as almost equally important. They were always below 0·5 per cent. when the kidney was damaged, and might fall to 0·01 per cent. in water-logged cases. Prognosis in nephritis was extremely difficult, for cases varied enormously. "Trench nephritis" cases might clear up completely in a few months, but civil cases ran a very chronic course. He regarded kidney disease as analogous to asthma and hay fever—a sensitisation of the kidney tissue to some particular toxin, for instance, streptococcal sore-throat. It was extraordinary how sensitive the kidney might be and how varied its response. Patients should be given hospital treatment for many months. The symptoms did not go pari passu with the blood-urea, but urea tests were valuable in distinguishing between renal and cardiac

cases. He thought that chronic dropsical cases might sometimes be syphilitic.

Dr. J. W. MCNEE agreed with Sir Thomas Horder that it would be a pity to reduce the tests to two and forget how crude they were. Extra-renal factors such as diet, failure of the liver or cardiac disability counted in them for a great deal. He regarded the blood-urea as valuable, not as a single estimation, but as a constant guide to the progress of the case. The urea-concentration test, unfortunately, did not always give the information required of it. The water-concentration test was easy and often most informative; it showed if the kidney had lost the power to concentrate, and distinguished between the high blood pressure conditions and true chronic nephritis. The blood-creatinin test was also useful. Frequently a case would get much better within a few weeks and the albuminuria be reduced to ½ or 1 per cent., but there the child would stick and continue to show casts. The attitude of the doctor should be to expect a complete cure in the majority of his cases, and he should go on trying for it until there was other evidence to show that the case had gone on to a progressive nephritis. A valuable sign of this was the appearance of fatty casts containing doubly refracting fat. He regarded diuretics as "hit or miss" drugs, possibly entirely non-specific, and began always by giving a fair trial to those least likely to do harm. He had found that better results followed the low protein diet given in America than the more haphazard diets of this country. Chronic cases often did best on a mixed average diet.

Mr. CYRIL NITCH dealt with the surgical aspect, and said that he relied most on the urea-concentration and blood-urea tests, but regarded the clinical condition of the patient as a third test of equal importance. He only used indigo-carmine when it was inadvisable to catheterise a ureter; it was not very reliable. Specimens for urea-concentration tests should be collected by an indwelling catheter, as residual urine would vitiate the findings. He did not think the blood-urea figure of much value unless it was over 50 mg. per 100 c.cm., when it was a contra-indication to operation. He quoted two cases showing that the concentration of urea was not a reliable guide to prognosis, but he would not care to operate if the figure were lower than 1·7 per cent.

Dr. GEOFFREY EVANS pointed out that the use of these tests was to test renal function, not the fact of renal disease; they were no use for the diagnosis or prognosis of early kidney disease, as they were only positive when the reserve of the organ was lost. Nephritis might go on for five years without failure of renal function. More important than the symptoms of failure of renal function were the signs of renal disease, such as hæmorrhages—in kidney, retinæ, uterus, &c. Marked albuminuria was a significant indication of active disease. When looking for casts it was important to see that the urine was fresh and not very dilute. The most important part of the treatment was lengthy rest in bed, up to 12 months if necessary, at any rate until there were no red blood cells in the urine. Once a patient got well he remained well. Obvious septic foci should be removed. Too little was known about diuretics for a pronouncement on their value or harm. Diuresis might depend on extra-renal factors, as had been shown by recent experiments with "euphyllin," a diuretic which worked by causing a discharge of chlorides from the cells and their accumulation in the blood.

SECTION OF COMPARATIVE MEDICINE.

A MEETING of this Section was held on Feb. 24th, with Mr. F. T. G. HOBDAY, the President, in the chair, when Dr. P. H. MANSON-BAHR read a paper on the *Relation of Wild Animals to Certain Diseases of Man.* He said that nowadays it was only in the tropics that man still came into the necessary prolonged and intimate contact with the fauna of his neighbourhood and so became a prey to their disease germs. It was probable that the virulence of these germs was originally much greater and that a state of harmony between host and parasite had been gradually attained, the germ retaining its virulence for non-immune individuals. The susceptibility of man to parasitic diseases of animals was strong evidence in favour of the Darwinian hypothesis.

Trypanosomiasis.—The various trypanosomes had become adapted to apparently harmless existence in the blood of many varieties of animals, especially in Africa. Man had become infected only with *T. gambiense* and *T. rhodesiense* in Africa and with *T. cruzi* in South America. The range of sleeping sickness was co-terminous with that of the definitive host, the tsetse-fly. There was much evidence that the infection was now essentially spread from man to man, but Speke's sitatunga, a handsome antelope which had been found naturally infected, was admirably adapted to act as a reservoir of the trypanosome by its wary habits and its range in dense and impenetrable papyrus on the lakes and swamps of Eastern and Central Africa. The sleeping sickness of *T. rhodesiense* was a more rapid, fatal, and resistant form than that of *T. gambiense*, and its distribution corresponded very closely to that of the tsetse of big game. The trypanosome of the big game in this area was indistinguishable morphologically from *T. rhodesiense*, and some observers believed them to be identical. The common waterbuck, the reedbuck, and the duikerbuck were commonly considered to be the reservoir hosts of *T. rhodesiense*. The disease produced by the South American trypanosome was a chronic or acute disease of a myxœdematous character, chiefly seen in children, and the definitive host was a curious reduviid bug, *Triatoma megista*, which was often found naturally infected and lived on armadilloes. The other reservoir hosts were the Azara's opossum and the rock cavy of Brazil.

Leishmaniasis.—The peculiar distribution of kala-azar and its association in the Mediterranean basin with a similar infection in dogs indicated that it was in some way connected with a free-living reservoir host. It was communicable to laboratory animals, jackals and monkeys with difficulty, but recently Smiley, Young, and Meleney had found that the hamster was readily susceptible, and that an enormous proliferation of the parasite took place within this animal, without apparently affecting its health. Possibly, therefore, the parasite was transferred to man from this small rodent through the agency of a biting fly such as Phlebotomus.

Leptospiral Infections.—Weil's disease was described in 1886, and its parasite in 1916. The *Leptospira icterohæmorrhagiæ* had since been found to exist normally in the urinary tubules of the European rat and Japanese field vole. A young fox was recently found naturally infected near Mill Hill, and captive animals might contract the disease through eating infected rats. Infected hosts passed the organism in the urine, and spirochætes of this type had recently been found widely distributed in water. Why the closely related Leptospira of yellow fever was a parasite of man only was a matter of much interest; probably the reservoir animal had yet to be discovered. The *Leptospira hebdomadis* of the seven-day fever of the Japanese lived similarly in the urinary tract of the common field vole, *Microtus montebelloi*.

Rat-bite Fever.—The spirillum of this world-wide disease was transmitted by the brown rat (*R. rattus* and *R. alexandrinus*) and was probably identical with *Spirillum laverani* and *Spirillum muris*, commonly found in the blood of rats and mice. The bite of the ferret and domestic cat had also been incriminated.

Rocky Mountain Spotted Fever.—This severe typhus-like disease was endemic in limited districts of Montana, Idaho, and Wyoming. The causative *Dermacentroxenus rickettsi* was conveyed by the bite of a local tick which commonly infested the Rocky Mountain goat, badger, lynx, bear, coyote, and other animals. The larval and nymph stages of the tick developed principally on the ground squirrel and

woodchuck, which were considered to be the main reservoir hosts of the Rickettsia.

Plague.—Although the black rat (*R. rattus*) and its variants were the main reservoir host of plague, several other rodents might replace it. The ground-squirrel played an important part in California and in Southern Russia and Mongolia. The summer outbreaks of pneumonic plague in Mongolia and Manchuria corresponded with the hibernating habits of the ground-squirrels. In these regions the common house mouse was held responsible for winter outbreaks, though it was not incriminated elsewhere. In North China, Siberia, and Manchuria the Mongolian marmot was said to harbour the bacillus during hibernation and to cause outbreaks among the hunters, who lived huddled in underground hovels during autumn and winter. The musk-shrew and Bandicoot rat also played a part in plague propagation in India. Plague was first introduced into South Africa in 1901 and was then confined to domestic rats, but further outbreaks showed that the Cape hare, white-nosed rat, Cape jumping hare, and gerbilles were responsible for transmitting the infection. Carnivores preying on these rodents died of plague, and when the authorities found the remains of gerbilles in the fæces of sick mongooses and suricats, they took it as an indication that plague was endemic in that area. A shrew which lived in the houses in Senegal and West Africa was said to carry plague, and rabbits and hares had been found naturally infected in England.

Tularæmia.—This plague-like disease affected jack-rabbits, gophers, and other rodents in California, and was communicable to man, particularly field workers and dealers handling infected rodents.

Melioidosis.—This was a glanders-like disease of man occurring in Burma and the Malay States. The organism—*B. whitmori*—was a natural infection of the Malay rat, the local representative of *R. rattus*.

Malaria.—Strangely enough, human malarial parasites had never been found in any other vertebrate, although the great apes had their own species of plasmodium, from which it might be inferred that the original reservoir host of man's malaria was some extinct anthropoid. It was still a puzzle how these parasites with an intricate life-history became adapted to such dissimilar hosts. Possibly the blood protozoa of mammals were once parasitic in plants and became adapted to insects which fed on these plants, and thence to warm-blooded animals. Flagellates closely allied to Leishmania had been found in the latex of plants, and Migone had recently shown that a plant bug was responsible for the spread of infection from plant to plant in Portugal. Morphologically, these and other flagellates inhabiting the intestine of house-flies, blue-bottles, and biting flies were indistinguishable from leishmania and trypanosomes.

Dr. Manson-Bahr illustrated his paper with numerous lantern slides and stuffed specimens of the animals mentioned.

Discussion.

Dr. A. BALFOUR said that the problem of the origin of disease was insoluble, but the question of how human disease due to animal and vegetable parasites first began might be answered some day. The study of parasites responsible for certain plant and animal diseases suggested that the process of adaptation had been at work from the very earliest times. So far the only plant disease that could be called transmissible to man was the *Bacterium tumefaciens*. Recent research had not encouraged the idea that the leptospiral forms in insects were related to trypanosomes. It was curious that no reptile or bird had been incriminated in human disease; the only bird diseases conveyed to man were the psittacosis and aspergillosis of the domesticated parrot. It was most important to keep plague out of a country, for once it got in it was impossible to control these small rodents who might harbour it. Possibly we should find that wild animals played a greater part in the dissemination of disease than was yet known.

Dr. H. H. A. SCOTT mentioned rabies and the presence of *B. aertrycke* in some hamadryad baboons, causing acute intestinal infection; also that of the Morgan I. bacillus, which was associated with summer diarrhœa in infants, in some cercopitheque monkeys at the Zoo.

Dr. T. W. CAMERON referred to the helminth infections carried by wild animals, particularly the echinococcus, recently found in the wild fox. The parrot carried an organism probably identical with paratyphoid B, and all three forms of *B. tuberculosis*. The diphtheria said to be conveyed by wood pigeons and chickens was due to a totally different type of organism from the human bacillus, though the avian condition had caused a few cases of pseudo-diphtheria in children. Domestic ducks might harbour *B. aertrycke*. Anthrax decimated the mammals of Africa; he asked whether it could be conveyed to man through eating infected flesh.

Major C. D. DAVENPORT asked what was the relationship between the dog, the bug, and Leishmania.

Dr. MANSON-BAHR, in reply, said that man was not subject to plant diseases because he had largely ceased eating raw vegetables. Ergotism was perhaps the only exception, except for the recent suggestion that beri-beri was not a deficiency disease but was due to eating rice infected by a fungus. Birds were so delicate and died so rapidly from any infection that they were not likely to convey disease to man. The rabies conveyed by wild animals was much more virulent than that of the dog, possibly because jackals and wolves lacerated the faces and heads of their victims. Anthrax was usually destroyed by the gastric juice and so was not conveyed by ingestion. The Mediterranean dog was susceptible to Leishmania and got something very like kala-azar, but the Indian dog did not, probably because the bug did not carry kala-azar and the sandfly did. In the Mediterranean area the dogs lived so close to man that the Phlebotomus transmitted the disease to both.

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES.

AT a meeting of this Society, held at the rooms of the Medical Society of London on Feb. 26th, with Dr. WILFRID S. FOX, the President, in the chair, a discussion on

SYPHILIS OF THE HEART AND AORTA

was opened by Sir THOMAS HORDER, who dealt especially with the early signs and symptoms of this condition.

The importance of the subject, said Sir Thomas Horder, rested on four basic facts. The first was that syphilis was a disease which was eminently amenable to treatment. The second was that in this, as in so many other disease processes, the success of treatment was in direct proportion to the early commencement of it. Thirdly, the tissues concerned were of vital importance, not only to health, but to life; and fourthly, if structural changes had set in before the disease was recognised, then, even though healing took place to a large extent, as it was known to do, the secondary changes in heart and aorta resulted in a limitation of activity, and even premature death. Hence the supreme importance of making every effort to diagnose and commence to treat the disease before these structural changes had set in. The post-mortem room evidence was that syphilitic disease of these structures was not rare; there was an incongruity between this evidence and that of clinical experience, in that the physician seldom satisfied himself that he was dealing with an early case of syphilitic disease of the aorta or of the heart. Thus it was a duty to be constantly on the lookout for the disease in practice, especially as it was very prone to be latent. One reason for this

latency seemed to be that neither of the structures of the heart which yielded physical signs was often affected by syphilis—namely, the pericardium and the endocardium. All were familiar with cases of aortic incompetence which there seemed every reason to attribute to old syphilis. He sometimes drew attention to what he believed to be a parasyphilitic lesion of the mitral cusps, taking the form of mitral regurgitation, with a highly musical apical systolic bruit, of the kind one encountered in the routine examination of cases of tabes dorsalis. Also, there was a typical condition of heart-block when anatomical change had occurred in the bundle of His. But he did not propose to deal with parasyphilitic disease of the cardiovascular system, but rather to draw attention to the disease in its early and progressive stages, and afterwards to consider what was the appropriate treatment.

Sir Thomas Horder did not doubt that the thoracic aorta was more often attacked by syphilis in its early stages than was the heart itself, judging by the post-mortem data, the ascending part of the thoracic arch being the zone of attack par excellence. When the structures near the heart were involved by the disease there were two zones specially liable to attack—namely, the circle of Willis and its branches, and the base of the aorta and the part immediately above it. Between the primary infection and the invasion of these structures the period seemed to be about the same in each—namely, from five to ten years. He did not share the view held by some that it was not until later in the life-history of the disease that these structures were implicated. These manifestations were seen in people of 25 to 30, rather than from 30 to 40 years of age. All sorts of syphilitic developments occurred later in life, aneurysm a little later, aortic regurgitation later still. The doctor should be on the scene before these late sequelæ developed.

Symptoms of Early Involvement of the Aorta.—These, said Sir Thomas Horder, were largely problematical, and he was anxious by collaboration to agree on signs which would stand the test of experience. He could never feel quite certain of his diagnosis of syphilitic aortitis, but he insisted that the safe course was to treat the patient as a syphilitic suspect. He attached great importance to substernal pain, which he could reasonably attribute to the aorta, which was a very sensitive structure in a young man or woman. This anginoid pain was liable to be increased by effort, but was not necessarily induced by effort. One of the cases which he considered had this disease was sent to him as severe cardiospasm, the pain having been attributed to acid dyspepsia in a nervous subject. The speaker was not satisfied about the character of the aortic second sound; there was a clear history of infection seven years previously, and his blood gave a trebly-positive Wassermann, the Sigma reaction also being very definite. Anti-syphilitic treatment with prolonged rest brought about a complete cure. Pain he regarded as very important.

Less helpful because more vague subjective features were the following. First, a sense of oppression and discomfort in the chest, increased by effort; what could be expressed as an "aortic consciousness" as opposed to a "heart consciousness." Secondly, there was shortness of breath, but the number of conditions in which this was present reduced its diagnostic value. Added to this was a feeling of general physical slackness, coupled with some anæmia. Early physical signs of syphilitic aortitis were problematical. In none of the kind of patients under consideration could he satisfy himself that the aorta was dilated, though he was aware it had been reported, especially by the French, whose clinical picture of aortitis was much more elaborate than ours. Syphilitic mesaortitis was a patchy condition; and if it were so diffuse as to lead to dilatation of the aorta in a man aged 30 or 40, it would be so serious that the examination of it would probably be made in the post-mortem room. There was something helpful in the character of the sounds in these cases. In all cases in which there was substernal pain an aortic second sound should be carefully criticised. He considered that a blurring or lack of clearness in this sound should be seriously regarded, and it should be listened for also down the sternum and at the bottom of that bone. The late Sir William Osler spoke of the pulmonary base as "the area of auscultatory romance," but the speaker rather regarded this xiphoid region as the area of auscultatory neglect. Sometimes a definite and distinct aortic bruit could be heard there and nowhere else. A further suspicious feature was a sharply accentuated second sound in the absence of hyperpiesis, but he did not regard this as of equal importance to the last named. Collateral signs of syphilis were also very valuable, but they were not looked for unless the possibility of syphilis was in the examiner's mind. He referred to such conditions as leucoplakia, old scars, pigmentations, &c. And in a suspicious case the complement-fixation test would be tried. He did not regard the presence of an aortic diastolic bruit as a proof of permanent aortic incompetence.

Early involvement of the heart by syphilis was detected less commonly than in the case of syphilis of the aorta, partly because the important guide, pain, was absent in the heart cases. In hearts affected by syphilis there might be a sudden rupture of an aneurysm in the heart wall, or the production of an ischæmic infarct might result from endarteritis of branches of the coronary vessels. In regard to the heart in this connexion, he knew of only one suggestive feature—namely, the so-called heart-block syndrome. If that were present in any degree in a person under 50 there was always the hope that his syphilitic disease would respond to treatment.

Treatment.—On the subject of treatment Sir Thomas Horder said he had not much to offer. When it was proposed to treat a vascular lesion of supposed syphilitic origin he was often asked whether one should proceed slowly and vary the usual routine. The practice was to proceed with caution, though he was not aware of any real reason for doing so. Certainly there was great need to proceed as intensively as possible, short of inviting disaster. He had seen neo-kharsivan and such remedies given with much boldness, and had shivered for the result, but his anxiety had proved to have been misplaced. His own aim in these cases was to be very intensive and very prompt with mercury, giving iodide of potassium at the same time, and following this up by a routine series of doses of novarsenobillon, &c. Once having started treatment, he did not give these cases any smaller doses than he gave to any other syphilitic patients. He believed greatly in prolonged rest in the recumbent posture before starting therapeutic treatment.

Syphilitic Endocarditis.

DR. F. W. PRICE, who followed, dealt with the acquired form of the disease in the heart and aorta. Syphilis, he said, might attack the aorta, the cardiac valves, the coronary arteries, the myocardium, and the pericardium. Inflammation of the media of the vessels might be followed by necrosis of the elastic tissue and muscle-fibres, and, at a later period, by a new formation of fibrous tissue, thus bringing about a local weakening of the vessel, leading to aneurysm of almost any size. The thickening of the intima was a secondary protective or compensatory process. Fatty and calcareous degeneration was not present in the early stage of the disease. Secondary thickening of the intima had been erroneously confused with atheroma. The auriculo-ventricular bundle might be involved in the disease and cause heart-block. Syphilis of the pericardium was very rare. A histological diagnosis was very difficult, even in the early stage. He did not believe syphilis caused primary atheroma, but it was responsible for a large proportion of cases of aortic incompetence,

and was an important factor in angina pectoris in patients under 40 years of age. Still, in the main, he considered that the part played by syphilis in the causation of diseases of the heart was over-stated. Dr. Price dealt fully with the symptoms and clinical signs of the disease in heart and aorta, and in the main agreed with Sir Thomas Horder. The prognosis, he said, depended largely on the stage at which the diagnosis was made, and on the kind of treatment adopted. Taking cases as a whole the prognosis was very unfavourable, perhaps largely because usually the diagnosis was not made until a late stage of the disease. The hope was that this defect would be increasingly remedied. In the absence of aortic incompetence the prognosis was more favourable. Prompt treatment sometimes prevented the more serious sequelæ. He agreed as to the great value of prolonged rest, and he did not regard signs of cardiac failure as a contra-indication to antisyphilitic treatment.

Discussion.

The PRESIDENT agreed that, in the face of a positive diagnosis, there was no reason why cases of the kind being discussed should not be treated actively, especially as damage to heart and vessel walls was such a serious matter. He also referred to the diagnostic value of the provocative dose.

Dr. STRICKLAND GOODALL spoke of an experience of 220 cases of cardiovascular syphilis. When the myocardium was involved the signs produced depended on the part of that structure chiefly affected. If chiefly the auricle was damaged, auricular fibrillation was not uncommon; 14 of the 220 cases showed this. When the bundle of His was involved heart-block, either partial or complete, was produced. The electrocardiograph was very valuable in the diagnosis of myocarditis. In his 220 cases syphilitic pericarditis was present in only four. He was glad to hear Dr. Price say that in syphilitic aortic regurgitation there was not much ventricular hypertrophy, as it was a very important means of differentiation from other forms. He was glad also to hear of the faith still persisting in mercury and iodide of potassium.

Colonel L. W. HARRISON said it was evident that by the time the physician was able to detect syphilis of the aorta or of the myocardium much damage had already been wrought by the disease. In the primary lesion the outstanding fact was the disease of blood-vessels, and the resultant fibrosis was the great enemy. Early treatment was directed to forestalling this crippling fibrosis. A statement frequently made was that it was unnecessary to treat a patient because of a persistently positive Wassermann if there were no symptoms, but the latency of cardiovascular syphilis and the difficulty of diagnosing it until serious damage had been done was a sufficient answer to those who took that attitude. With regard to treatment there was much difference of opinion as to the use of arsenical preparations, particularly in myocarditis, but he thought the arsenobenzol treatment had a definite place in the treatment of both myocarditis and aneurysm, though in the first of these care must be exercised. If small doses were commenced with and slowly increased there would be very little shock.

Sir THOMAS HORDER and Dr. PRICE replied.

ERRATA.—Dr. Knyvett Gordon points out that in the report of his remarks made at the discussion at the Medical Society of London on cholecystitis and published in THE LANCET of Feb. 27th, p. 442, the words "Histological examination of the blood was of some value in the diagnosis *of gall-stones*" should have read "*of cholecystitis*," and "*the diastatic content of the urine* was also important" should have read "*the diastatic contents of the blood and urine*."

Reviews and Notices of Books.

THE YOUNG DELINQUENT.

By CYRIL BURT, M.A., D.Sc. Oxon., Professor of Education in the University of London; Psychologist in the Education Department of the London County Council. London: University of London Press, Ltd. 1925. Pp. 643. 17*s.* 6*d.*

Dr. Burt's position as an authoritative exponent of the psychology of childhood is already well established. This book, the first of a series of three dealing with mental abnormalities in the child, while nominally concerned only with the juvenile delinquent, might well serve as a text-book of psychology in general. The parts respectively played by intelligence, instincts, sentiments, and complexes in the determination of conduct are lucidly outlined and their abnormal developments illustrated by concrete cases of delinquency. From a psychological standpoint the book is more systematic than Dr. William Healy's Individual Delinquent, the only other comparable book on the subject, and one which has had much influence in America in stimulating the movement for the psychological examination of all delinquents. Dr. Healy's own work in Chicago and Boston soon found followers, and psychiatric clinics are now a recognised institution. In England it is still necessary to plead for them, and Dr. Burt's book may be regarded as an argument in their favour. In an appendix he describes the equipment necessary for such a clinic.

The work is an expression of the modern attitude to crime and the criminal. It is not so long since the criminal was looked upon as a degenerate human type, mentally and morally separated by a deep gulf from average humanity; he was born to crime and yet, by a curious paradox, regarded, if sane, by the law as responsible for his acts and a fit subject for punishment. In this book the criminal is seen as being of like passions with ourselves; the fundamental point of view is that "crime is a mental symptom with a mental origin," an origin usually multiple, and that until the origin is discovered there is no basis for suitable treatment, which must be primarily remedial and only secondarily punitive, the punishment fitting the criminal rather than the crime. In a series of fascinating chapters the author discusses, on the basis of observations of a large group of delinquents and a corresponding group of controls, the various causes he has discovered—hereditary, environmental, physical, intellectual, and temperamental—distinguishing also the most essential factor in each case from the less important contributory ones. The analysis is searching; the individual cases quoted give some idea of the care exercised in collecting and collating facts, in reaching a diagnosis and suggesting appropriate treatment. The readiness of magistrates to attribute all crime to picture-houses and pernicious literature might be effectively curbed by a perusal of the book; it might induce also an appropriate diffidence in dealing with such cases.

The rôle of heredity has, in Dr. Burt's opinion, been much exaggerated. "Contagion," he remarks, "is too often mistaken for heredity," and "the case of sporadic crime is more usual than the case with a criminal lineage." In between 60 and 65 per cent. of his cases the delinquencies were precipitated primarily by the difficulties of the environment or by personal history. In this connexion he has much to say of home discipline, and he points out the great difficulty an investigator has in obtaining a clear understanding of the home atmosphere, the emotional relations of its members to one another, and their reactions upon each other—factors often of supreme moment in delinquent cases. Sometimes, he adds, the offender is the most normal member of his group. But, whatever the external conditions that act upon the criminal, it is the reaction of his own mind to the conditions that determines the result; mental factors and particularly emotional factors count most.

Dr. Burt here reiterates his frequently-expressed opinion that the "moral imbecile" of the Mental Deficiency Act represents no true psychological entity, and pleads for the legal recognition of the "temperamentally defective." Expert opinion will now in the main agree with him. Treatment is discussed at very considerable length and with system. It should obviously begin early, before the habit of crime is established, must be adapted to the individual child, and also to the nature of the causes that provoked the crime. Special institutions designed for children of unstable constitution are urgently required.

This is a book to be read and re-read, and retained for reference by all interested in the moral welfare of young people.

INHERITANCE OF CANCER.

Our Present Knowledge of Heredity. Six Lectures under the Mayo Foundation, by W. E. CASTLE, C. E. MCCLUNG, J. A. DETLEFSEN, MAUD SLYE, H. G. WELLS, and M. F. GUYER. London and Philadelphia: W. B. Saunders Company. 1925. Pp. 250. 12*s*.

OF books on heredity there is no end, and these lectures given at various American universities under the auspices of the Mayo Foundation for Medical Education and Research would seem to be hardly worth a permanent presentation to medical men were it not for the inclusion among them of a statement by Miss Slye of the splendid mouse-breeding experiment which she has carried on at Chicago with such devotion for many years, and of a singularly comprehensive account of the inheritance of cancer from all its aspects by Prof. H. Gideon Wells, which incidentally has already appeared in the *Journal of the American Medical Association*.[1] The question whether cancer is heritable is one which disturbs the lay public more than it does the profession, who have settled that the practical importance of a cancerous ancestry is, to all appearances, negligible in man. Miss Slye concludes quite definitely—and supports her conclusion by the largest mass of accurate data which have ever been collected on the subject—that resistance to cancer is a unit character which is transmitted as a straightforward Mendelian dominant. Similarly the tendency to develop cancer is a unit Mendelian recessive which explains why it may remain hidden through several generations until the chance mating of the appropriate heterozygotes brings it out in a proportion of the children. Whether cancer actually develops or not in a homozygous recessive depends on the stimulus which the tissues receive. Taking as illustrative the example with which we are now familiar, the occurrence of cancer is the product of the heritable qualities of an organ in respect of cancer resistance and the irritation which it receives from outside. Miss Slye, by deliberate breeding, has produced strains of mice which nearly never or nearly always develop malignant tumours under the conditions of life which prevail in her mouse town. What happens when these two strains are, e.g., painted with tar seems to be unknown, but it has been ascertained that the children of rats in which cancer develops in relation to the liver cysts of *Tænia crassicollis* are much more prone than usual to respond in the same way to the presence of the parasite; in other words, the readiness with which irritation will cause cancer is shown to be heritable. The difficulty which arises from this relationship between inherited tendency and irritation is that it is hardly possible to regard the tendency as a single unit character if it is so variable, and Miss Slye frankly allows that some animals have it to a greater and some to a lesser degree and will require less and more irritation respectively to produce a frank cancer. Her main position is, however, not seriously affected if several factors are involved, and her account of her results deserves careful and attentive study by everyone who is interested in the third largest cause of death in this country. Prof. Wells's lecture covers a wider field, and gives an account of such human experience as is seriously germane to the question and of the results, homologous and analogous, of other investigators. His conclusion is that inherited tendency is one of the most important factors which determine the occurrence of malignant tumours. The last of the six lectures is on "eugenics," by Prof. Guyer; he does not venture to state what practical application should be made of Miss Slye's results. The truth probably is that something could be done if people felt keenly enough about it; and that it would not amount to very much. If the tendency to have cancer is a recessive character, most of the people who have it do not show any signs of it in their own persons; they cannot be killed, segegrated, or even disliked, and indeed nothing may be known to their discredit till, long after they are dead, some of their children develop cancer. On the other hand, if Miss Slye and Prof. Wells are right, deliberately and productively to marry the child of cancerous parents is looking for trouble. As with mental deficiency, another Mendelian recessive, such selective breeding as is possible would have an effect, but it would not be large and would take a long time to show.

[1] Jour. Amer. Med. Assoc., 1923, lxxxi., 1017, 1103.

DISEASES OF THE GUMS AND ORAL MUCOUS MEMBRANE.

Second edition. By Sir KENNETH GOADBY, K.B.E., Lecturer on Bacteriology of the Mouth, Dental Department, University College Hospital. London: Humphrey Milford, Oxford University Press. 1925. Pp. 408. 42*s*.

THE peculiar virtue of this book is that it is equally satisfying to the doctor and dentist. The former will find an adequate account of the pathology of what may be called the special dental diseases, not too technical though by no means superficial. To the latter the book is welcome for the account it gives of those rarer manifestations of disease in the mouth, the study of which hardly falls within the dental curriculum. The significance of dental disease in relation to the general health receives a detailed consideration, and the bacteriology of the mouth is clearly described. The general plan of the book has undergone no change, but certain additions have been made, notably a chapter on vaccine therapy and a section treating of the toxic heart in relation to dental sepsis. The method of injecting vaccines into the diseased area as advocated by Besredka is not mentioned, though it has received a wide publicity through its application to pyorrhœa by Goldenburg. It is surprising to find only a cursory reference to the root tumours so often found at the apices of dead teeth, for in the opinion of many observers this closed type of sepsis may be more harmful to the general health than the open lesions of pyorrhœa. The author apparently regards them as a form of chronic alveolar abscess, but their structure does not wholly support this view. Their pathology is admittedly obscure. It is quite possible that the radiographic appearance of apical rarefaction has received too great attention and may not warrant the sinister interpretation often placed upon it. A more detailed study of this aspect of dental infection both in regard to its bacteriology and its relation to systemic infection would be a valuable addition to the next edition of this work. No reference is made to the work of A. F. Hurst on achlorhydria and its bearing on pyorrhœa and systemic infection. Hurst's views, though still hypothetical, have so much clinical support that it becomes necessary to consider them in any account of dental disease as a factor in general disease. It is just in a book of this kind which is widely read both by the medical and dental professions that a full-dress study of focal infection in the mouth in relation to general disease would be specially valuable. The chapters on the special diseases of the mouth and gums, with excellent coloured plates, and on diseases with oral symptoms still remain the best sections of an admirable book.

SCOLIOSIS.

Rotary Lateral Curvature of the Spine. By SAMUEL KLEINBERG, M.D., F.A.C.S., Assistant Surgeon, New York Hospital for Ruptured and Crippled: Member of the American Orthopedic Association. New York: Paul B. Hoeber, Inc. 1926. With 140 illustrations. Pp. xvi. + 311. $6.

IT seems that with the best will in the world it is difficult to find anything new to say on this subject. Dr. Kleinberg has had good opportunities, of which he has well availed himself, of studying and treating scoliosis, and he has produced a sumptuous book, but he is able to bring forward little or nothing new on the pathology, ætiology, or treatment of this deformity, which in its worse forms is so distressing and so resistant to treatment. However, to those who would have in concise form a statement of what is known of this deformity and what measures can or should be taken to combat it, we recommend this book, which is illustrated by figures of great technical beauty and clarity. Dr. Kleinberg holds out no extravagant hopes of cure of structural scoliosis with bone deformity and his views on prognosis are sound and trustworthy.

JOURNALS.

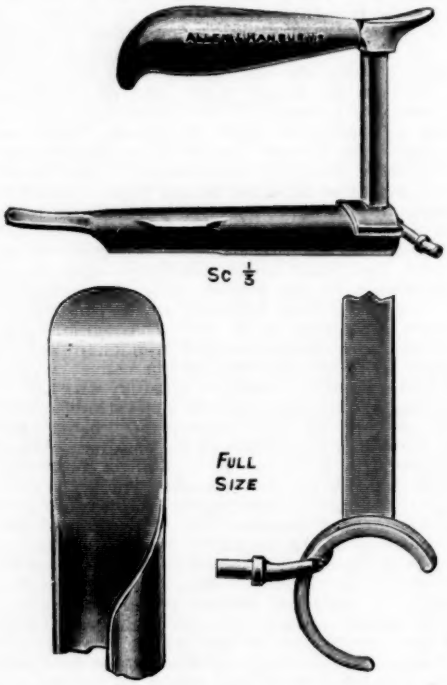
BRITISH JOURNAL OF OPHTHALMOLOGY. February, 1926.—This number contains two papers of clinical and pathological interest. The first is on Inflammatory Pseudo-tumours of the Orbit, by F. A. Williamson-Noble. Two examples of this somewhat uncommon condition are described, and also a third in which a blind eye was excised for a supposed intra-ocular tumour but in which no true tumour was discovered. In the first case, in which the proptosis was well marked but the vision good (6/12), the orbit was exenterated in the belief that a neoplasm was present. The condition found was a large gummatous mass surrounding the optic nerve within the muscular cone. This case should be compared with one reported by Mr. Lindsay Rea in which the proptosis was binocular but the Wassermann reaction positive, and which yielded to energetic antisyphilitic treatment.[1] In Mr. Williamson-Noble's second case the proptosis was also binocular, but in one eye became so marked that the probability of malignancy seemed so great that exenteration of the orbit was performed. Nothing was found except lymphocytic proliferation. It is suggested that the condition was due originally to infection by the blood stream from some distant focus, and that after the infection had subsided a mass of lymphocytes were left which continued to proliferate. (Mr. Richardson Cross published a binocular case in 1916 which he attributed to lymphoma.) In Mr. Williamson-Noble's third case there was no actual proptosis, but there was a condition found which, if left, would probably have caused proptosis. As a result of irritation induced by cholesterin crystals derived from an old intra-ocular hæmorrhage in an old blind eye, a small mass of young connective tissue was found outside the sclera after the eye had been excised. This is noted as a third possible explanation to account for some of these obscure cases of proptosis. Their clinical importance is great. No more difficult problem for the ophthalmic surgeon arises than whether or not to advise the sacrifice of an eye which retains useful vision on the ground of the possible but unproved presence of a malignant tumour.—The second paper is by J. A. Conway on Two Cases of Cerebral Aneurysm causing Ocular Symptoms, with Notes of other Cases. Aneurysm of a cerebral artery is seldom diagnosed but, it seems, is not so very rarely discovered on the post-mortem table. In the first case there was bitemporal hemianopia with some expansion of the sella turcica according to the X ray report, both symptoms pointing to the possibility of a pituitary tumour. Post mortem an aneurysm attached to the right middle cerebral artery was discovered. The aneurysm was old and completely filled with laminated clot. It occupied the sella, whilst the pituitary, normal in size and appearance, was lying behind it. An interesting point about this case is that before death the fields of vision which at one time had been hemianopic had almost recovered their normal size. Presumably this was due to the shrinking of the mass. In the second case an aneurysm occupied a considerable part of the cerebellum and caused optic neuritis so that a cerebellar tumour was simulated. With regard to the causation of these cerebral aneurysms Conway finds that in the majority of cases no sign of vascular or cardiac disease has been discovered, and concludes with Turnbull that in these cases the formation of a breach in the media is due to an inborn defect in the arterial wall.

[1] THE LANCET, 1925, ii., 503.

New Inventions.

AN IMPROVED LARYNGOSCOPE FOR ANÆSTHETISTS.

THE laryngoscope here illustrated, although conforming in general outline to other similar patterns, embodies certain features which have proved useful in passing catheters and their accompanying expiratory tubes through the larynx. These are: (1) efficient illumination from a lens-fronted electric bulb of the size usual in sigmoidoscopes; (2) the distal end of the speculum is flat, wide, and tilted slightly upwards—an advantage in elevating and controlling the epiglottis; (3) the unusual width of the slot at the side facilitates the passing of catheters and tubes for expiration without obscuring the visual field; (4) the lug at the proximal end of the handle affords a purchase for the thumb, which is of value in manipulating the instrument into position. The handle is not detachable, and the barrel, which is polished within as well as without, is constructed of stainless steel.



The instrument is supplied by Messrs. Allen and Hanburys, Ltd., of Wigmore-street, W. 1, and also by Messrs. Down Bros., of St. Thomas's-street, S.E. 1.

I. W. MAGILL, M.B., B.Ch. Belf.

THE LANCET.

LONDON: SATURDAY, MARCH 6, 1926.

HEALTH INSURANCE PROPOSALS.

THE report of the Royal Commission on National Health Insurance is characterised by caution, and our readers would be well advised, in regard to the extensions of benefits which are recommended, to observe particularly that these are only to be made as and when funds are available to meet the cost. The recommendations will contain few surprises for those who have followed the running summary of evidence which has appeared in our columns—and, we believe, nowhere else—and especially the official evidence given during the later proceedings of the Commission. We have had occasion to observe that the Commission would feel restrained by the chilling hand of finance, and now the report actually appears shortly after the coming into operation of the new burden on the community of the cost of pensions insurance; it also immediately precedes the introduction of an Economy Bill. Rumour has meanwhile been busy in regard to proposals on the part of the Exchequer to shed some part of its contribution to a scheme which in two successive valuations has disclosed such enormous surpluses, and which appears therefore to have been rather more abundantly endowed than the present economic situation would permit. Those who would look for heroic recommendations or drastic extensions of services must derive such cold comfort as they can from the report of a minority of four members of the Commission, whose conclusions are based upon the view that it is neither necessary nor proper to confine the development of a National Health Insurance scheme to such as can be paid for within the present financial resources of the scheme as proposed in the main report. The report recognises that National Health Insurance has established its position as a permanent feature of the social system in this country; in contrast to the paucity of evidence directed against the general principles of the scheme, a large body of evidence in its favour was received by the Commission. Medical benefit, it is declared, has been a valued and successful element in the scheme, and it is suggested that the existing machinery for regulating admission to and removal from the medical panel, and for dealing with complaints, should be continued generally in its present form. No changes are proposed in the method of remuneration, but it is urged that any settlements in the rate of remuneration of insurance practitioners should be made valid over a reasonable period of years, so as to avoid financial uncertainties.

We have given, on p. 000, an extract from the report embodying the principal recommendations for extensions of benefit, and the Commission have followed the practice, foreshadowed in their method of examining witnesses, of setting forth an order of priority for the extensions recommended. First in order comes the extension of the scope of medical benefit, which would take the form of the provision of (*a*) expert medical advice and treatment for persons who can travel to meet the specialist; (*b*) expert advice for persons who are unable to travel; and (*c*) laboratory services. This recommendation has very properly been given priority as the medical benefit under the Act has suffered throughout from limitations imposed by financial considerations and stated by the Commission to call urgently for removal. It would seem that, owing to the fact that sickness has cost less than was originally anticipated, there is a margin available out of present contributions, and the Commission expressly recommends that this margin should be applied to its full extent towards meeting the cost of extending the statutory benefits. The medical profession, as made clear by their evidence, are ready to coöperate with the Government in bringing into operation the extension of the scope of medical benefit which is contemplated. This extended service is not to be provided by way of development of the out-patient work of the hospitals, but through an independent scheme organised under the direction of the Ministry of Health through the whole country by the insurance committees or their successors as an integral part of medical benefit. Provision in the scheme should, it is recommended, be made for the closest coöperation between the general practitioners and the specialists, particularly for the exchange of information as to cases, and for the giving of definite guidance to the general practitioner as to both diagnosis and treatment. Any practitioner possessing the requisite qualifications should be entitled to take part in the work, and the decision as to whether particular practitioners possess these qualifications would lie in the hands of a mixed lay and medical committee for each area. It will be observed with interest that ophthalmic benefit would be recognised as part of the expert out-patient service under the scheme, and would be available only on the recommendation of the general practitioner. The second recommendation in order of priority is for the provision of allowances in respect of dependants of insured persons in receipt of sickness or disablement benefit. This takes the form of a small addition to the worker's own sick benefit, and must not be confused with any extension of medical benefit to dependants, which, as we some time ago indicated, is not in the region of practical politics. There will be general agreement with the next recommendation that there should be an improved provision at the time of pregnancy and childbirth for insured women and the wives of insured men. As soon as funds are available, the scope of maternity benefit should, it is said, be expanded to cover medical and midwifery services in addition to a cash payment; the service element should then be administered by the local health authorities and coördinated with the other local medical services, and a cash element would be retained and be administered in connexion with other cash benefits.

The Commission gives its blessing to a complete dental service available to the whole insured population as an eminently desirable addition to the insurance scheme, and our readers will remember that there has throughout the evidence been an insistent demand for such a service and a readiness on the part of approved societies to anticipate future surpluses by ear-marking part of the contributions for a statutory dental benefit. This, however, has been found to be financially impracticable at present, and is placed fourth in order of priority. The existing arrangements whereby dental benefit is one of the additional benefits administered by the societies out of their surpluses will continue, subject to an important provision that the organisation and supervision of the service should rest with the central department, and to an interesting proposal that a regional dental staff should be appointed for the safeguarding of the funds of the societies concerned, and largely paid for

by them. In regard to the additional benefits generally, in spite of their unequal distribution and the lack of uniformity in their administration, it is not considered that there should be any change at the present time, but that the approved societies should continue as heretofore to administer these benefits. Some mitigation of the inequalities should, it is thought, be effected by the partial pooling of surpluses on lines indicated in the report. The approved society system stands firm for the present in regard to cash benefits generally, but it is foreshadowed that their position might have to be reconsidered in the event of fundamental changes being made in the system of social insurance. As was generally anticipated, it is recommended that insurance committees should be abolished, and their powers and duties transferred to committees of the appropriate local authorities, such committees to contain possibly a proportion of coöpted members; while a pious hope is expressed that regard should always be had, in any developments of the insurance medical service, to the importance of the fullest possible coördination with other health services. The general question of coördination, being a very wide one, is not unfairly regarded as outside the scope of this Commission's deliberations.

The principal recommendation which emerges—the extension of the scope of medical benefit—will, we hope, be capable of immediate realisation, and the Minister of Health may be expected, in closest consultation with the representatives of the profession, to give effect to this recommendation, and so make good what has always been recognised as a serious defect in the medical benefit provisions of the National Health Insurance Acts. So much we feel justified in anticipating.

MORVAN'S DISEASE.

THE history of the disease, or more properly speaking the syndrome to which the name of MORVAN is attached, is a fine illustration of the advances in medical knowledge which may follow the astute observations of those engaged in general practice. It is proper that consulting physicians should acknowledge the debt that we all owe to such observers, and Prof. C. ACHARD, in the latest volume [1] of the Clinics of the Hôpital Beaujon, has seen fit to devote the first of an absorbing series of essays to the story of MORVAN'S discovery. In 1883 Dr. MORVAN, a general practitioner of Lannilis in Brittany, published an account of seven cases of which the outstanding clinical feature had been the occurrence of recurrent painless whitlows appearing on both hands. He stressed the symmetrical nature of the lesions, noted their occasional occurrence in the lower extremities, and formulated the hypothesis that the anatomical site of the primary disease lay in the cervical portion of the spinal cord. His observations had extended over a period of 30 years. The discovery was followed by isolated reports of similar examples of this phenomenon, and three years later, in a second memoir, MORVAN reported eight further cases, giving a description of the painless arthropathies sometimes accompanying the disease and of the scoliosis which was usually present. During the following three or four years the pathology of the disease remained entirely obscure; autopsies on cases had not been performed, or rather the rare autopsies had been conducted in circumstances which did not allow of immediate examination of the nervous tissues, and whilst some neurologists, by a process of deduction, held that syringomyelia was the essential cause of the disease, others, basing their views on the rare sections of nerves which had been seen, believed the disease to be of the nature of a peripheral neuritis. At last a complete post-mortem examination of a case of Morvan's disease, dying in the Salpêtrière, disclosed a typical state of syringomyelia, so that the majority of French neurologists, headed by CHARCOT, were convinced that this was but a clinical type of the latter malady. The interest of the lay public in France in matters concerning medicine and pathology is well illustrated by the fact that in 1893 MARCEL PRÉVOST published a novel entitled L'Automne d'une Femme, containing a full description of Morvan's disease and attributing its origin to syringomyelia. Meanwhile there remained certain adherents to the theory that neuritis rather than an intraspinal lesion was the primary disease. DEJERINE particularly clung to this, and drawing attention to the frequency of occurrence in a circumscribed area in Brittany, suggested the probability of an infective neuritis analogous to that seen in leprosy; but the controversy was rendered even more bitter by the intervention of ZAMBACO Pasha of Constantinople, an acknowledged authority on leprosy, who maintained that both Morvan's disease and syringomyelia were nothing more or less than manifestations of that dreaded infection. This opinion has not been upheld by subsequent experience; to-day it is agreed that the essential lesions of leprosy are found in the peripheral nerves, and that the excess of neuroglia with cavity formation in the cord is not found in that disease. And it is further held, by those best qualified to judge from a wide experience, that Morvan's disease is but a syndrome, whose painless whitlows are the expression of syringomyelia in nearly all cases, but that in rare cases leprosy affecting the peripheral nerves has been its cause.

[1] Clinique Médicale de l'Hôpital Beaujon, Second Series. Paris: Masson. Pp. 336. Fr.24.

IRREGULAR MEDICAL PRACTICE.

ON Monday last Lord DAWSON OF PENN addressed a meeting of both Houses of Parliament on the subject of medical practice by the unqualified, and a summary of his words and of the discussion which arose thereon will be found in another column. Open debate free from animus between the public and the medical profession ought to make plain that scientific medicine is not afraid of competition, and various Members of both Houses of Parliament put questions to Lord DAWSON, the answers to which must have considerably cleared away general misunderstandings, and should lead to a wiser spirit of criticism. The acrimony which has marked recent strictures of the medical profession should cease to be displayed by reasonable people, appreciating that the policy of the profession is conducted by its members with the utmost desire for the public weal, and is regulated by Acts of Parliament having no other object.

Of all the lessons which Lord DAWSON was able to draw from his experience as clinician and teacher, none probably will be more useful to the public than his insistence that education and training along a standardised course must precede any attempt to solve the problems of medicine. This fact is not only made patent by the Medical Acts, where such a course is laid down as necessary for the equipment of all medical men in order that the public may be protected from the perils of untested pretensions, but it is recognised also within the course itself, where two-thirds of the time which is compulsorily expended in medical education and training is consumed in the

acquisition by the students of fundamental scientific knowledge and comprehension of general principles, only a third of the curriculum being devoted to learning the methods of treatment in their application to the sick. This is only another way of stating the truism that while upon diagnosis depends all that is trustworthy in medical practice, the power of diagnosis can come only to those who have built their education upon sound foundations. The therapeutic developments of the present, with their remarkable promise, and the hard-won wisdom of the past, are stultified alike if the patient is not submitted to the general and particular scrutiny which those who have been fully trained can provide—and no others. Treatment must bulk most largely in the public eye; the patient desires to be treated and is not concerned in making inquiries into the academic equipment of his doctor. To a certain extent he can judge of treatment by its results, and to a certain extent he will be, and should be, influenced by the statements of doctors in regard to ability to deal with the condition. But it is a fact that many a condition appears to improve under very varying procedures, and the man without qualifications, one of what the Minister of Health termed "the irregular army," unable to produce any other evidence of his knowledge, must depend for public support mainly upon the assertion of his successes, and there is no scientific ground for approval of his methods and no real proof that they have been fortunate to the extent claimed. For these practitioners we have seen support claimed on the ground that they are concentrating their mental powers, whose sharpness, it is stated, has never been blunted by the accumulation of irrelevant knowledge, upon the one thing that matters—namely, treatment—and the public have lost sight of the fallacy in the argument, so much is treatment the thing with which they are concerned. Treatment can only be administered logically in proportion as the cause of the condition has been ascertained, and the only way to wrest from medical science the capacity for diagnosis is through submission to an arduous course of training. As Lord DAWSON said, "wonder-working short cuts" should be distrusted, and so should the independent diagnoses of those who are not properly equipped. The therapeutic methods of these may often be useful, but their diagnoses are simply dangerous.

JAMES MACKENZIE INSTITUTE FOR CLINICAL RESEARCH.—The Schick test was the subject of a paper by Dr. Matthew Fyfe, medical officer of health for St. Andrews and clinical pathologist to the Institute. After a reference to the incidence and death-rate of diphtheria and to the expenditure incurred by isolation and treatment, Dr. Fyfe gave a description of the Schick test. By its use during an epidemic it was possible to detect susceptible contacts who could then be temporarily immunised by antitoxin. When time permitted toxoid antitoxin could be employed to produce a more lasting immunity. He described the passive immunity, apparently derived from the mother, of newborn infants, the gradual loss of this in the first two years of life, and the gradual development of acquired immunity after puberty, and emphasised the high incidence and death-rate of diphtheria from the second to the tenth years of life. The value of the Schick test as a check on vague bacteriological reports and as an aid in the identification of carriers was illustrated, and its simplicity, cheapness, and safety were emphasised. In conclusion, Dr. Fyfe referred to the results of immunisation of Schick-positive subjects in Great Britain and elsewhere. He looked forward to a time when by a general adoption of these methods diphtheria would be banished from the list of common diseases dangerous to life.

Annotations.

"Ne quid nimis."

THE POLLUTION OF STREAMS.

To a recent number of the "Public Health Reports,"[1] issued weekly by the United States Public Health Service, Surgeon W. H. Frost contributed an interesting review of the work done by the service on stream pollution. The first systematic research on the effects of sewage pollution in a large area was made in 1910 by Surgeon A. J. McLaughlin; but it was not until 1913 that the services of engineers, chemists, biologists, and bacteriologists were enlisted in carrying out a concerted plan of investigation. Between that year and 1917, when America entered the war, a good deal of work was undertaken, notably on the biochemistry of sewage, the treatment of industrial waste, and the effects of natural purification in inland and tidal rivers. In 1920 the undertaking was resumed, and a survey was made of municipal methods of sewage disposal and of arrangements for water purification in a number of cities on the Ohio River and elsewhere. The object of this last investigation was mainly to ascertain the exact relations between pollution of raw water and the quality of effluent obtained under varying processes and conditions of treatment. In addition to this a good deal of laboratory work has been done during the last few years. In Cincinnati various investigations have been made, including an attempt—so far not very successful—to reproduce on a small scale the phenomena of bacterial purification as they are seen in small streams. The biological oxygen demand of sewage, of industrial waste, and of polluted river waters has been studied carefully, and experimental research on the relation of pollution to the quality of effluent has been carried out in extension of the field work done on the efficiency of municipal filter plant; experimental sand filtration plant was designed so that the conditions of loading and of operation could be varied at will through a wide range. Research on the phenomena of bacterial purification has incidentally involved rather extensive study of the biology of plankton, and other useful theoretical work has been done by Dr. William Mansfield Clark, of the Hygienic Laboratory, who has been working for several years on the physical chemistry of coagulation in so far as it bears on the purification of water. In a general review of the subject Surgeon Frost points out that the resources at present available are inadequate to cover the many fields of work which claim attention. Even now 85–90 per cent. of sewage in the United States is discharged without treatment into convenient streams; though, as he hints, there seems little justification for this state of affairs now that the best means of purifying sewage are fairly established. Surgeon Frost does not, however, consider that the risk of local authorities drawing their water from polluted streams justifies intervention by the public health service, for the purification methods at present known are capable of dealing with the pollution. In his forecast of future developments he seems, while he admits the complexity of the subject, to be employing the work and recommendations of our own Royal Commission on Sewage Disposal. It hardly appears that he is fully conversant with their results, for he remarks:

"Unfortunately, sanitary science has not furnished such full and precise knowledge as will be required on any of these points, especially in regard to the natural agencies which tend so greatly and rapidly to reduce bacterial contamination and which constitute one of the main reliances for protection of health. Moreover, it seems unlikely that it will be possible to borrow this knowledge from the experience of other more densely populated countries, as the writer knows of no other country having similar problems in the control of stream pollution on a comparable scale and for a similar purpose; that will probably have to be studied successfully before a solution becomes necessary for some of the great river systems in the United States."

[1] Public Health Reports, Jan. 15th, 1926, vol. xli., No. 3.

In making these comments he does not seem to have taken full account of the work of Boyce on the Severn and Houston on the Thames, or of the investigations of Adeney on oxidation, of McGowan on aeration tests, of Fowler, Ardern and Haworth on bio-aeration of sewage, or of the progress made by the Conservancy Boards during the last 30 years. Also he seems to have forgotten that the Royal Commission, having arrived tentatively at certain standards for sewage effluents, tested their practical value all over the country, in rivers with all degrees of pollution and dilution. The observations, it will be remembered, included topographical notes on apparent nuisance (smell, foul deposits, fungoid growths, and the like), and involved numerous chemical, biological, and bacteriological investigations. The West Riding Rivers Conservancy Board, although dealing almost exclusively with non-drinking water streams, has, during the last 30 years or more, contributed so much to the general store of knowledge of river pollution that all countries might well feel that their own problems were simplified, and other good spade-work has been done by the neighbouring Mersey and Irwell and Ribble Joint Committee Boards. Be that as it may, we fully appreciate the excellent work carried out by the Public Health Service of the United States. It has proved of signal value in connexion with our own pressing problems of pollution and purification, and will certainly be of like value in the future.

CLEAN FOOD.

A JOINT committee of the Royal Sanitary Institute and the Society of Medical Officers of Health have just issued their report [1] on the question of food handling in this country. The method adopted by the committee was to depute the investigations of various branches of the subject to individual members of the committee, and the report now published contains an account of these individual investigations and the general conclusions of the committee thereon. The committee are greatly impressed by the fact that Great Britain alone among the more advanced nations has failed to take cognisance of the existence of risks to health from careless handling of food, and to provide legislation for the protection of the people from such risk. This fact is well brought out by the epitome of food legislation and regulations in other countries prepared by Dr. Francis J. Allan. The difficulties in the way of producing direct evidence of injury to health from the careless handling of food are emphasised, but there will be, we think, general agreement with the findings of the committee that there are sufficient grounds on the plea of cleanliness and decency, and probably of disease prevention, for devoting much greater attention to these matters. It may be true that the majority of the people are apathetic, but it is also true that there is an increasing body of public opinion which demands the exercise of greater care. The committee urge that all food premises should be registered with the local authority, and that no premises shall be occupied for any purpose connected with the preparation, storage, or sale of food until they have been so registered. The final report of the Departmental Committee on the Use of Preservatives is quoted in favour of further control of methods of food preparation. Some progress has been made with regard to milk, and the meat regulations which came into force on April 1st, 1925, have already raised the standard of meat purveying. There is much greater reason, however, for regulations with regard to other foods, especially those which are consumed uncooked, than there was in the case of meat. The efforts made in America to eliminate from the food trade persons who are capable of carrying diseases are quoted with approval in the report. The joint committee placed their views before the Minister of Health on Nov. 16th, 1925, the procedure which they recommend being first of all registration, and in the second place regulation. It is suggested that one set of regulations might deal with principles of common application to most foodstuffs and that separate regulations might be made for special foods. The committee recommend that local authorities should have power to make by-laws subject to the approval of the central authority, and that the central authority should issue model by-laws for the guidance of local authorities. This question of care in the handling of food is intimately connected with that of the use of preservatives and the enlightenment of the public as to what they are purchasing. We have hitherto depended far too much upon the principle of *caveat emptor*. As the report points out again and again, education of the public and of the trades concerned is a necessary preliminary to progress.

[1] From the Secretary, Royal Sanitary Institute, 90, Buckingham Palace-road, London, S.W. 1. 2s.

SOCIAL HYGIENE: THE IMPERIAL ASPECT.

RECENT reports by Government officials and representatives of voluntary organisations go to show that the problem of venereal disease within the Empire is a very serious one which has been largely left untouched. Thus the Mandates Commission of the League of Nations has recently drawn attention to the prevalence and apparent increase of venereal disease among the native populations of the African Mandated Territories. The East African Commission has pointed out that everywhere in that part of the world the infantile mortality-rate is grievously high, "being due mainly to venereal disease, ignorance of child welfare, and tribal customs." In the district of Bunyore, in Uganda, for example, it is estimated that practically the whole population is syphilitic. In the Wood report on conditions in the West Indies it is stated that venereal diseases are rife and that very little headway has yet been made against their further spread, while in many of our Far Eastern possessions and colonial seaports the prevalence of venereal disease is a matter of grave concern to the medical services of the navy and mercantile marine. In certain places the solution of the problem is largely bound up with the provision of an adequate medical service. In Nyasaland, for example, the total European medical staff amounts to 14, which leaves a working total of 10 or 11, and these have to deal with a native population of nearly two millions. The principal medical officer of the Tanganyika Territory estimates that less than one-twenty-fifth of the population is within the sphere of medical influence. The problem of providing an adequate medical service appears to be largely a financial one, and under the scheme for the East African Development Loan, shortly to come before Parliament, it is recommended that a certain proportion be allocated for the medical services. Unfortunately, it appears from certain official pronouncements that this may all be used for endowing certain institutions for scientific research. With regard to venereal disease, enough is known to permit of very satisfactory measures of diagnosis and treatment, and it is adequate medical services rather than further research which is necessary if this Empire problem is to be solved. That this is so is shown in the case of Uganda, where, five years ago, the population was falling, largely owing to the prevalence of venereal disease. With increased expenditure in general health measures, including £22,000 for antivenereal work in 1923, this fall has been checked and the health of the tribes in the area has been sensibly improved. The spread of venereal disease in Hong-Kong and Singapore has been brought under control to a certain extent by the comparatively recent provision of facilities for free treatment, but it also appears necessary that all known centres of prostitution should be eliminated. In many of the ports of the China station, according to Surgeon-Commander T. B. Shaw, speaking at the Imperial Social Hygiene Congress at Wembley, promiscuous sexual intercourse is "made more easy by the presence of regulated or tolerated brothels." Thus the venereal disease problem in the Empire affects not only the native populations but also visiting members of the

navy and mercantile marine. From the economic point of view the virility and efficiency of the native races is of prime importance to the development and maintenance of the Empire, while the dangers of prevalent disease among a shifting population as represented by seamen is too obvious to require emphasis. From a financial point of view, again, to put it no higher, any expenditure on combating venereal disease within the Empire will certainly be money well spent.

BURNS FROM A NEW POINT OF VIEW.[1]

THIS is not a disquisition on a painful group of injuries, but a study of Scotland's greatest poet—a reprint of a series of articles originally published in the *Glasgow Herald* with the object of rehabilitating the memory of Burns which, according to Sir James Crichton-Browne, has been smirched by his biographers. The popular estimate of Burns is that he was a genius from peasant stock who wrote lyrics of surpassing beauty but who died at the early age of 37 worn out by drink and debauchery. The former portion of the estimate is true, but the latter portion, according to Burns's latest learned biographer, is entirely erroneous and is mainly due to the life written by Currie, "the arch calumniator," who was a fanatical teetotaller and could not forgive Burns's frequent allusions to wine and women, nor his somewhat latitudinarian views on religion. No doubt the popular estimate of Burns as a drink-sodden debauchee is wrong, but we think that Sir James Crichton-Browne makes too little of his failings, which failings he certainly did not minimise himself. The author considers that Burns's death was due to an exacerbation of the chronic endocarditis from which he had probably suffered from his early days, but even he allows that "an injudicious use of alcohol may have hastened its progress." Many people in the eighteenth century drank too much, and it is not surprising if Burns did so also, but the many allusions to drink in his verse and letters do not necessarily mean that he was a drunkard, any more than the similar passages in Anacreon or Herrick mean that they exceeded. Burns is, anyhow, too firmly enshrined in the hearts of millions to have his fame diminished by the failures and irregularities which are common to all of us, and, more especially, it seems, to the creative artist.

HEALTH OF THE U.S. NAVY AND ARMY IN 1924.

THERE were 119,000 men in the Navy of the United States in 1924—the total figure is not definitely stated but can be arrived at from percentages which are based upon figures. This force had, per 1000, 496 admissions for disease, 61 for accident, 557 in all. The death-rates were, for disease, 1·78, for accident, 2·39, total 4·18. The most frequent cause for admission was gonorrhœa, with tonsillitis second. Tubercle caused 237 admissions, more cases than there were in the smaller British Navy in 1922, the last year of which we have yet been told, but fewer per 1000, 2·00 against 2·26. Dysentery cases are divided, as they should be, into bacillary (1·15 per 1000), and amœbic (0·34), in all 1·49. Stress is being definitely laid on keeping personnel fit and preventing invaliding. There are 824 medical officers, which is 1 to 144 personnel, but there is no statement of the number of associated civilians for whom they have also to care, such as is given for the Army.

In the Army of the United States in 1924 there were 136,485 men, and the Medical Department had under its charge another 75,000 civilians, as well as many pensioners. In the Army there were, per 1000, 535 admissions for disease, 121 for injury, 656 in all. The deaths were, from disease, 1·94, from injury, 1·89, in all 3·83. The chief causes of death were, in order, suicide, tuberculosis, automobiles, and airplane accidents. These last are becoming less frequent, and the flying hours per death have increased in four years from 955 to 3365. The leading cause of non-effectiveness was venereal disease, but the rate has been reduced by two-thirds since 1908 when the preventive campaign was inaugurated. The Army daily appreciates more highly the work of the Dental Corps. It is the Veterinary Corps, a corps within the Army Medical Department, that examines meat, dairy products, &c., before acceptance. This inspection, saving the Army from buying bad food and forage, is thought to prevent a waste of money annually greater than the whole cost of the Veterinary Corps, which thus, it is supposed, pays for itself on a side issue.

The Surgeons-General of the Army and Navy of the United States follow a commendable routine in publishing simultaneously the statistical data of the year within a twelvemonth of its expiry. Their reports are abstracted in the *Military Surgeon* for January on which we have here drawn. Both services have increased their medical personnel by accepting on graduation senior medical students, who join the service hospitals as interns on the full pay of first lieutenants. They have the opportunity a year later, if approved, of joining their service, and in fact many of them do so.

SPECIFIC FACTORS AND ANTITOXIN PRODUCTION.

IN the effort to produce therapeutic antitoxins of high specific value two lines of approach to the problem are open. On the one hand, we have the attempts, which are constantly made, to find types of antigen especially suitable for this purpose, and to ascertain the route, dose, and time of injection which will yield the most favourable results. On the other hand are the endeavours to modify the wholly unknown mechanism by which antitoxins are produced and to augment the output. Such endeavours have been, as a rule, empirical, although sometimes successful, and G. Ramon [1] has recorded the most recent of these. His attention was arrested by the fact that amongst a series of animals used for the production of diphtheria antitoxin, the concentration of this did not in all cases fall off after the bleedings had been initiated. As a rule the curve of antitoxin concentration in the animal's blood, having reached its highest point, thereafter progressively falls. In some cases Ramon found the fall to be checked and an augmentation to occur which occasionally was considerable. Investigating the matter further he found that the animals which behaved in this way were the ones which developed abscesses at the site of inoculation due to skin infection. He further was able to show that such augmentation in the antitoxic value of the animal's serum only occurred when the abscess was at the site of inoculation of the serum and not if it were elsewhere. Moreover, a quasi-chronic infection was more effective than an acute one associated with much constitutional disturbance. The investigator proceeded to reproduce the natural phenomenon experimentally in the endeavour to achieve a useful increase in the antitoxin of his sera and, after essaying various non-bacterial irritants, he found that starch, in the form of semolina, introduced along with the toxin or anatoxin with which the animal was injected, produced a local inflammatory reaction of the type desired. In experiments which are quoted upon diphtheria antitoxin production, the horses subjected to this procedure gave a yield of toxin which was approximately double that of animals hyper-immunised in the usual way, whilst in the case of tetanus the antitoxin yield by the new technique was as much as ten times that obtained from control animals. These observations are of importance as well as of practical interest to those engaged in the commercial production of antitoxin, whilst on the other hand they may be extended to throw some light upon the obscure question of the mechanism of the process.

[1] By Sir James Crichton-Browne. London: Holder and Stoughton. 1926. Pp. 92. 2*s*. 6*d*.

[1] Annales de l'Institut Pasteur, vol. xl., No. 1, January, 1926.

NEW PENSIONS REGULATIONS.

THE National Health Insurance Joint Committee, in conjunction with the Treasury, have published draft regulations which, although they do not take effect until 1928, are of immediate interest to large numbers who may contemplate becoming voluntary contributors under the combined scheme of health insurance and contributory pensions. The persons mainly concerned are those engaged in certain "excepted employments" under the Crown, public authorities, railway companies, &c., who pay contributions at a reduced rate for widows' and orphans' pensions only or who would pay these contributions if their remuneration did not exceed £250 a year. They are not insured for old age pensions under the Contributory Pensions Act, because they are already provided for in this respect by the terms of their employment, and they cannot qualify for these pensions in addition to their superannuation allowances by becoming voluntary contributors (if qualified), or taking up insurable employment, except so far as may be provided by regulation. The effect of the regulations now published is to enable those who are under 45 on becoming voluntary contributors or employed contributors, and also those who have already been insured under the health insurance scheme from some date prior to the passing of the Pensions Act, to qualify on the usual terms for pensions at 65 at the full rate of 10*s.* a week. As to the remainder, the rate of pension payable, if and when they retire on superannuation will be scaled down according to their age at last entry into full insurance —viz., 9*s.* a week where the age was 45 or 46 at entry, 8*s.* where the age was 47 or 48, and so on, down to 2*s.* where the age was 59; and where the person was 60 or over at entry no old age pension will be payable. Persons who have already retired from employment of the kind mentioned above will be subject to the same regulations. Somewhat similar provisions will apply to exempt persons over 45 who surrender their exemption certificates and become insured, as well as to men over 45 who become voluntary contributors on the ground of previous employment if they held exemption certificates when employed.

STATUS LYMPHATICUS: AN INVESTIGATION.

AUTHORITIES have long differed on the importance, the frequency, and even the existence of status lymphaticus, and the Medical Research Council and the Pathological Society of Great Britain and Ireland may count on the willing coöperation of the profession in their attempt to throw light on the subject. Such an attempt is not, of course, new. An investigation was begun in 1914 but the work was interrupted by the war, and the death of the organiser, Prof. Emrys Roberts of Cardiff, was a further blow to the undertaking. A short interim report was eventually published,[1] but the material was too scanty to permit of authoritative conclusions, and the present scheme aims at collecting a much larger mass of information. The committee that has been formed has 15 members, nearly all of whom are professors of pathology in universities throughout Great Britain, and the scheme includes the appointment of investigators in large centres who will collect detailed records. This, however, will only be a part of the work, and all pathologists and others who make post-mortem examinations are earnestly invited to coöperate. The special objects of the investigation at present are:—

1. To establish, by means of a large series of weights and measurements, the standards of weight for age and proportion to body-weight of the normal thymus at all ages.

2. To investigate closely the precise cause of death in persons dying suddenly from unexplained and trivial causes, where the only apparent abnormality is the presence of a large thymus.

The committee wants the appropriate information for all cases of sudden death in apparently healthy persons, including deaths from accident, and for all cases of death in persons of 15 years or over who have an apparently glandular thymus. Not all workers, of course, have time to make very elaborate investigations, and two kinds of record card have therefore been prepared, one of them for the special investigator and the other for the busy worker who would like to help the committee as far as he can but is unable to do more than give a brief account of his cases. It is hoped that a great many practitioners will use the cards. Application for them should be made to the secretary of the committee, Dr. Howel Evans, Pathological Department, University of Liverpool.

[1] Journal of Pathology and Bacteriology, April, 1925.

HYGIENE ON THE SEA.

ACCOMMODATION for seamen in ships of to-day is well illustrated in the *Asturias*, the new liner built by the Royal Mail Steam Packet Company for the South American passenger and emigrant trade to Brazil and the River Plate. The successor to the well-known hospital ship of the same name, torpedoed in the war, is the largest motor ship afloat. A special correspondent of THE LANCET was allowed by the Company to visit her before she sailed on her first voyage, and though opportunity was not forthcoming to ascertain the important particulars concerning ventilation, inspection showed the general advances made. Our correspondent writes:—

"Motor engines take up much less room than the old pattern, especially as there is no need for a boiler room, and the increased space available for crew and passengers is at once apparent, rooms and passages being nowhere less than ten feet high, constituting a vast improvement in comfort and making for health.

"The *Asturias* is a ship of 35,390 tons, 630 ft. long, 78 ft. broad, and her engines of 19,400 horse-power, working on two screws, drive her at 17½ knots. She has a crew of 465 all told, and carries 1324 passengers, 400 first-class, 250 second, and 674 third. Every compartment has supply and exhaust artificial ventilation, is heated by electric radiators, and has, it appears, one or more electric fans. All drinking water is filtered, probably by Chamberland-Pasteur candles. The stewards and crew are berthed in cabins giving them over the regulation 120 cub. ft. of space per man. There may be 12 beds together, but there are generally fewer; the beds are good, on iron standards, never, if I am right, against the ship's side, so they will not be wetted by condensation, as was once usual; besides there was cork paint—good cork paint and put on thick—to protect against the cold of winter. The lavatories in these sections are commodious but have only cold water laid on. There are full-sized baths in each section, and the water-closets are pedestal with a good flush, each in a separate compartment of sufficient size, and in each a fitting to take a roll of paper which we can hope will be provided. It is a pity that all the closets are not painted white, which shows up dirt so much more insistently. There are mess-rooms for each group of the crew. The stewards' accommodation is familiarly known on board ships as the 'gloryhole,' and one of the stewards here, being asked, said he had never seen a better 'gloryhole,' and he was probably right. Though a mess-room is provided for them, pressure of work sometimes compels them to take their dinners standing outside the pantry in the old, bad way; discipline would prevent this, and anyway, that area in this ship is airier and cooler than in most. Third-class passengers are berthed forward, and have a good saloon with the usual annexes; they sleep either on a troop-deck, with never more than four beds together, or in four-berth cabins, each with a folding wash-place, and water in cans. In all the passages are drinking taps with constant iced water-supply. The second-class cabins are aft; hot water is supplied to their basins. For the first-class there are the large and lofty saloon, numerous lounges, two libraries, a spacious verandah café, a smoking room, a large swimming bath, beautiful with white tiles and red walls, and the two promenade decks. The lower of these is some 13 ft. high, the upper is shut in with windows if desired, and higher still there is a belvedere. With all these chances of variety there should be no boredom on the voyage. There is a delightful nursery, with castle, swings, and other delights to keep the small children good tempered.

"There are two dispensaries, one with English, one with Spanish medicines. There are three hospitals, one, quite small, for the crew; one for infectious cases on the boat deck, with four beds for men in one section, four for women in another. On the main deck below is an extensive medical establishment, an inspection room with steriliser, hand-lamp, and other perquisites, the dispensary, a well-lighted and

ventilated padded room, a men's hospital of ten beds, an operating room, a maternity ward of two beds, a women's hospital of eight beds, and a dining-room for convalescent patients. There is a Clayton apparatus for sulphur fumigation, also a steam disinfector, and the ship has an electric laundry.

"Great attention has been paid to the kitchen arrangements. Each group, crew, third-, second- or first-class passengers, has its own galley or kitchen, and its bakery. Except for the stock-pots and the steaming of vegetables all cooking is done by electricity, and in each bakery there is an electric dough-mixer. The crew's galley marked, I thought, a great advance; it was so much better ventilated, so much more comfortable than another I recalled in a ship of this line some ten years ago. But it has still to be tested in the tropics."

It will be apparent from this report that the coming of the motor-ship has disarranged all the old ideas about the practice of ventilation in ships, whatever the mechanical details or structural technique. No longer is there a great hot mass of metal, water, and air extending three-quarters of the length of the ship, heating her up and all the air inside her as well, prepared to cause motion, that is ventilation, if escapes were provided, but to give trouble if they were not. It is a great satisfaction to hear of seamen working on board a ship in which they have, all of them, a decent life, free from unnecessary crude hardships. That such a state has been at last attained seems to justify the complaints of the neglect of hygiene and welfare at sea, voiced by THE LANCET and its contributors.[1] It remains to record our sense of the courtesy of the R.M.S.P. Company in permitting our representative to inspect their ship, and to thank the medical officer, Dr. J. W. Renton, for the assistance which he gave.

[1] See previous articles upon Hygiene on the Sea which appeared in THE LANCET in 1920, vol. ii., pp. 569, 666, 760, 1110, 1269; and in 1921, vol. i., pp. 90 and 1261.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

J. C. Soutter to be Surg.-Lt.

SMALL-POX PRECAUTIONS.

A Fleet order calling attention to the increasing prevalence of small-pox in the North of England advises all officers and men serving in ships and establishments at home who have not been revaccinated within the last five years to be revaccinated. The warning has been posted on the notice boards of messes of ships and establishments.

ROYAL ARMY MEDICAL CORPS.

Appointments made at the War Office: Maj. J. W. L. Scott to be Asst. Dir.-Gen., vice Maj. D. P. Watson (vacated).

Lt.-Col. A. O. B. Wroughton to be Col.

Maj. D. P. Watson to be Lt.-Col., vice Lt.-Col. A. O. B. Wroughton (promoted).

Maj. and Bt. Lt.-Col. O. Ievers to be Lt.-Col., vice Lt.-Col. and Bt. Col. Sir E. S. Worthington, to ret. pay.

Maj. A. C. H. Gray to be Lt.-Col., vice Lt.-Col. J. J. W. Prescott (promoted).

SUPPLEMENTARY RESERVE OF OFFICERS.

A. Hemingway to be Lt.

TERRITORIAL ARMY.

Capt. H. E. McCready to be Maj.

INDIAN MEDICAL SERVICES.

Col. A. N. Fleming to be Hon. Surg. to the King, vice Col. P. Dee (retd.).

Capt. H. H. Brown to be Maj.

The King has approved the retirement of Lt.-Cols. R. F. Standage and W. Gillitt.

Lieut.-Col. E. W. C. Bradfield, late First Surgeon, Madras, succeeds Lieut.-Col. R. G. G. Croly as Civil Surgeon, Trichinopoly. Col. H. Ainsworth has been nominated a member of the Bihar and Orissa Legislative Council. Lieut.-Col. J. B. D. Hunter, agency's surgeon, Nepal, has been posted as Residency's Surgeon, Rajkot. Mr. R. Burn, member, Board of Revenue, United Provinces, has been appointed President of Board of Public Health, United Provinces, vice Mr. A. W. Pim.

Lieut.-Col. Croly, Dr. Diwan Ali, civil surgeon, and Maj. N. C. Kapur have been granted leave.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

CLXIII.—STRICTURES OF THE URETHRA.

GONORRHŒA and trauma are responsible for the majority of organic strictures of the urethra. Lesions following the former condition are always situated in the penile urethra and never in the prostatic channel. They may be either single or multiple. When only one stricture is present it is most commonly placed in the region of the bulb, just in front of the triangular ligament. When multiple strictures exist, those situated near the external meatus are usually of larger calibre than those placed farther back and, moreover, are less amenable to treatment, a point of practical importance. Lesions resulting from trauma are usually associated with damage of the triangular ligament, in the neighbourhood of which structure they are invariably found. Fortunately, this type of stricture is uncommon, for it is extremely resistant to any form of treatment. Ulcerations following the impaction of calculi lead to a similar lesion. Spasm of the compressor urethræ, although not causing a stricture in the true sense, is often associated with an organic stricture and may act as a tiresome complication during the passage of instruments.

As a preliminary to treatment the following physical examination is required: (1) An external examination of the urethra, (*a*) to discover the site of the stricture and to obtain, if possible, some indication of its length and consistency, and (*b*) to define the presence of a periurethral inflammation, abscess formation, urinary extravasation of fistula; (2) a urethroscopic examination to define the site of the stricture, the position of its lumen in relation to urethral wall, the presence of multiple strictures, and the existence of false passages; some of these points can also be demonstrated by the passage of varying sized bougies; (3) an examination of the scrotum, to exclude the existence of an epididymitis; (4) an examination of the abdomen for the presence of distension of the bladder or enlargements of the kidneys; (5) an examination of the urine as indicating the presence of urethritis or general infection of the urinary passages; and (6) a general examination of the patient as indicative of severe lesions—e.g., cystitis, pyelitis, &c.—resulting from such infections. The necessity for carrying out such an investigation is urgent, since simple uncomplicated strictures, as a rule, call for instrumental treatment, whereas complicated ones demand more radical operatives measures.

Instrumental Treatment.

The instruments used for the dilatation of strictures are either silk-web French bougies or graduated steel sounds. Filiform bougies are extremely useful in tight strictures, especially those accompanied by retention of urine. Silk-web bougies should be smooth and pliable, especially at the tip, and should range in size from Fr. 0 to Fr. 24. A set of steel sounds ranging from 6/9 to 14/16 is required. Great care must be taken in sterilising the instruments. Silk-web bougies may be kept in tubes through which formalin vapour diffuses, can be placed in weak antiseptic solutions or be boiled for a short period of time just prior to their passage. Steel instruments should, of course, be boiled. Care must be taken to keep the urethra as clean as possible during the use of dilatation methods, especially if there is any urethritis or infection of the urinary passages; free diuresis and antiseptic drugs should be given a day before and after the passage of an instrument; in addition the lumen of the urethra should always be washed out with weak solutions of antiseptics, such as potassium permanganate (1–8000), oxycyanide of mercury (1–6000), &c., both before and after the operation. Pain during the passage of instruments can sometimes be avoided by the instillation of novocaine (2–4 per cent.) into the urethra by means of a syringe; the

use of warm lotions in irrigating the tract will sometimes prevent the production of spasm which may be induced by the passage of a bougie.

In passing filiform bougies extreme care must be exercised, as they are very prone to catch up the mucosa. If this persistently happens, the passage of a full-sized bougie down to the stricture will often stretch out these folds and permit of the successful passage of the finer sizes. The finer sized bougies are liable to catch in false passages; in this event leave the instrument in position and pass another of the same calibre alongside it; this may pass through the stricture. If the aperture in the stricture is eccentrically placed it is sometimes possible, especially if the urethra is filled with oil, to pass a fine bougie with its end tipped up in a manner similar to a "coudé" catheter. In the use of steel instruments the smaller sizes are to be avoided, for they are extremely liable to cause false passages; the larger sizes are especially useful in dilating cartilaginous strictures which run a tortuous course and are to be preferred to the silk-web bougies when the stricture has been well dilated. For example, silk-web bougies may be used up to Fr. 18 and then followed by the steel instruments. Sterile olive oil or liquid paraffin are the best lubricants.

The majority of strictures are cured by instrumental dilatation; three methods are in use—the slow or intermittent, the rapid or continuous, and the "forcible."

The *intermittent* method, consisting as it does in the passage of instruments at intervals of three to four days with the smaller sizes and weekly with the larger, is the preferable procedure as it is more likely to bring about satisfactory and permanent results; it has, however, the obvious disadvantage of prolonging the course of treatment, especially in obviously contracted strictures; moreover, it is not usually successful in its results in those strictures which have become markedly indurated and are only dilatable with difficulty. It is unwise to force the pace in the use of this method by too rapidly increasing the size of the instruments passed; it is better to stick to the rule of using the size smaller, the same size, and one size larger than that previously passed.

The *continuous* method necessitates the retention of bougies of increasing size in the urethra throughout the 24 hours, the urine being passed along the side of the bougie. This has the inevitable disadvantage of confining the patient to bed; at the same time it is a useful procedure to adopt in strictures of small size and especially in those where, for the convenience of the patient, a rapid dilatation is required. It is also valuable in some cases of urinary retention, for if a small-sized instrument is left in position even for a few hours, on withdrawal it will frequently be found that the patient can pass his water. In the treatment of tight strictures the method may be given a trial until the stricture is dilated to a reasonable size, when it may be replaced by the intermittent method. Some very indurated strictures which are unaffected by the intermittent method may respond to this procedure.

The so-called "*forcible*" *method.* Strictures should never be *forced*, but some strictures can be rapidly dilated at one sitting by the use of a succession of bougies or of such an instrument as a "whip" bougie. The method is applicable in those cases in which dilatation is urgently required; but it must only be used on a stricture of the annular type, composed of soft fibrous tissue which readily dilates. If this treatment is used in tough strictures the end-result may be disastrous.

Operative Treatment.

In practice operative measures are seldom required; they are indicated, however, for the following conditions: (1) impassable strictures; (2) those which are indurated and cartilaginous and on which dilatation methods make no impression; (3) recurrent strictures; (4) those in which the passage of an instrument is painful beyond the endurance of the patient; (5) those in which the passage of instruments causes hæmorrhage or fever; (6) those in which a speedy cure is essential; (7) strictures associated with pathological complications, such as periurethral abscess, fistula, severe cystitis or pyelitis.

The methods in use are excision, internal urethrotomy and external urethrotomy. Excision of a stricture is practised in some cases, especially those which are single, are placed in the bulbous urethra, and are of the tough, cartilaginous type; the spongy tissue involved is excised together with the fibrous stricture. More commonly internal and external urethrotomy are indicated. The results of each are equally good, but the former is followed by a shorter convalescence. It can only be used where the stricture has a sufficient lumen to admit of the passage of the small bougie which is attached as a guide to the end of the urethrotome.

External urethrotomy by Wheelhouse's method is the operation of choice in all cases of stricture in the region of the bulbous urethra which are impassable and are accompanied by periurethritis, periurethral abscess, fistula, extravasation of urine or severe cystitis. It is not applicable except in cases of dire necessity for strictures placed far forward in the urethra since a permanent fistula may result.

Retention of Urine.

Retention of urine associated with stricture is usually of the acute type, but may be of the chronic type accompanied by distension overflow. It is rare for a stricture to be so tight that no urine will pass through, although excessive indulgence in alcohol or over-eating will sometimes cause retention in the presence of a tight stricture, which might otherwise not occur; other causes of congestion of the urethra have similar effects. In these cases hot baths and the use of antispasmodic drugs will often give temporary relief.

The withdrawal of urine in cases of retention must be carefully performed as the sudden evacuation of fluid from the bladder may lead to suppression of urine, especially in cases of chronic retention. If it is possible to relieve the retention by catheterisation, the urine should be withdrawn slowly, complete emptying of the bladder being avoided. Sometimes the passage of a filiform bougie alone will enable the patient to pass his water naturally, either along its side or after its withdrawal; this should be followed by the passage of larger bougies; if this fails, then the smaller size should be left in position and the continuous method of dilatation proceeded with. If it is not possible to pass a catheter, an external urethrotomy should be performed, but circumstances may be such that this is not possible; a suprapubic puncture and withdrawal of urine through a suitably curved trocar and cannula may be carried out under local anæsthesia as an emergency measure. A preliminary incision of the superficial tissues is required; the same precaution of slow withdrawal of urine should be observed. This procedure should not be repeated if it is at all possible to divide the stricture.

After-treatment.

Both after dilatation by instruments and by incision strictures show a strong tendency to recontract. Prolonged observation is required; it is not sufficient to restore the lumen of the urethra to its normal calibre; it must be kept fully dilated. As a prophylactic measure the full-sized instrument must be passed at regular intervals—first weekly, then monthly, two monthly, &c., until a period of six months has elapsed between two successive passages. If there is no evidence of recontraction the patient may be regarded as cured, but if there is any sign of recurrence, then the treatment must be prolonged; in any case the patient will be taking a wise precaution if he has the instrument passed at least once or twice a year during the next five years. The whole course of treatment, varying, naturally, with the type of the original stricture, may thus extend over a period of eighteen months to two years. In addition, it must not be forgotten that the infection of the urinary tract behind the stricture must be dealt with coincidentally.

W. GIRLING BALL, F.R.C.S. Eng.,
Surgeon, with Charge of Out-patients, St. Bartholomew's Hospital.

Special Articles.

MEDICAL PRACTICE BY THE UNQUALIFIED:

LORD DAWSON'S ADDRESS AT THE HOUSE OF COMMONS.

ON Feb. 24th Lord Dawson of Penn addressed a meeting of about 60 Members of both Houses of Parliament on the Medical Profession, the General Medical Council, and the Public. The meeting was held in one of the committee rooms of the House of Commons.

Lieut.-Col. Fremantle, who presided, said that in October last a similar meeting had been held to investigate the claims put forward by osteopaths, chiropractors, and others for special registration. It was only fair that the doctors should now be allowed to have an innings, and Lord Dawson had kindly consented to come forward and state their case. Doctors sometimes differed from each other acutely, and those of them who were present would maintain their right to disagree with everything that Lord Dawson said. He asked members, therefore, not to take what Lord Dawson might say as necessarily expressing the opinion of the medical profession. On the other hand, however great might be their differences, there was one thing that member of the profession were unanimous upon—namely, to preserve the tradition entrusted to them to protect the interests of the public. The difficulty at the present time was that the public had not sufficiently recognised that the essential duty imposed on the General Medical Council by the Act of 1858 was the preservation of these interests. It would be of assistance to bear this essential principle in mind during the discussion.

SUMMARY OF THE ADDRESS.

Criticism of the Profession.

Lord Dawson said that the subject of his address was not only somewhat complex, but had become overlaid in the last few months by much diffuse argument and some bitterness of spirit. Whatever his own shortcomings, he could at least claim experience. By set purpose he had kept in contact with every class of the community, rich and poor, and had rendered continuous service on the staff of a great hospital. Yet never had he known the public criticism of the medical profession stronger than it was at this time. If he were told: "We chasten you because we love you," he would be tempted to retort: "Perhaps it was right to dissemble your love, but why did you kick me downstairs?" Of criticism in itself the profession made no complaint whatever; fair criticism was good for everybody, and perhaps it was more useful than praise. But in recent discussions there had been not a few suggestions that doctors were actuated by selfish class motives. That was not true. Doctors had the ordinary mixed motives of mankind. (If they were too good they would not understand their patients.) But was it likely that the doctor's life—with its long hours, its sacrifice of ease and leisure, and its contact with other people's troubles—would engender a selfish policy? The selfish, sordid view would be a negation of the doctor's work. True, the medical man had his foibles. He did not like a man who had made a discovery to make a secret of it; and if such secrecy was associated with gain the profession claimed the right to cast him out. That showed that in their ideals they put achievement before money. Again, if men were successful in their profession, their colleagues liked them to give up a certain amount of their time to unremunerative work in the service of others. And doctors were quixotic enough to inculcate principles of health which, if they were carried out, would go far to deprive them of their livelihood.

There was no doubt that at the present time there was disquiet in the minds of Parliament, the people, and the press, and it was right that the profession should meet the criticism and try to resolve the doubts. Controversy had turned on three topics; the grievances of Sir Herbert Barker and Dr. Axham, the work and status of the General Medical Council, and the relations of the profession to unqualified practice. Time would not allow him to deal with all of these subjects, and he would devote most of his address to the last because it largely covered the other two. In considering what should be the attitude of the profession towards unqualified practice, he wished to lay down two guiding principles. The first was that the good of the public should ever be the over-riding consideration. This the profession accepted without any hesitation whatever. The second was that the profession should avail itself of useful knowledge from whatever quarter it came. He ought to say at once that he did not contemplate that unqualified practice should be forbidden by legal enactment; the question at issue was rather whether unqualified practice should be recognised by the medical profession and the State.

Diagnosis and the Medical Curriculum.

A necessary preliminary to treatment was a knowledge of disease—its causes and its diagnosis. To attempt to treat disease without knowing what is wrong with the body as a whole (not with a part only) was admittedly an act of folly, and to gain such knowledge there must be careful organised training. Many people had an idea that when medical students were educated they were taught medicine from the outset. The average duration of the student's career as such was five and a half years, and it was sufficiently difficult to get the training into that time. The prime object was to educate the mind—certainly not to push in empirical facts. And half the student period was taken up with sciences which had no direct connexion with medicine: chemistry, physics, biology, physiology, anatomy, pathology. This education had to be carried on in buildings approved by an impartial authority. It was not concerned with medical theories, but with pure knowledge. There could not be two anatomies and two physiologies. It was not until the student came to his last two and a half or three years that he was taught disease; then he had to go into the wards, the post-mortem room, and the laboratory. And it was only at the end of his career that treatment came in, for it was recognised that the student could be quickly taught the principles of treatment if he was properly grounded. It was over treatment, however, that nearly all the controversies raged.

There should be no recognition of a man as an *independent* practitioner, said Lord Dawson, until he had had those years of training, and had studied the nature of disease and its diagnosis. And the training should be the same for all. In this matter there could not be the least compromise. Once a man had passed the tests at the end of his training no limits were placed upon him—he could follow his predilections. He might then, if he wished, become homœopath, osteopath, chiropractor, or anything else. If the osteopaths, for example, wished to further their cause, let them select able students, put them through the medical curriculum, and send them out as apostles of osteopathy. Truth would win. Some in the profession did, in fact, practise osteopathy, and their opinions were given a fair hearing. Having acquired the knowledge, a man was free to build what theories he liked, but not until he had learned his job. This principle held good in the faculties of law or engineering, and why should it not apply to medicine? Whatever a man's views on navigation might be, whatever his genius, he was not allowed to assume control of a ship until he had passed the tests prescribed for navigators. Why should less protection be afforded to the human ship sailing on the sea of life? On this matter of training the profession would never give way.

Callings Ancillary to Medicine.

Once a diagnosis had been made, continued Lord Dawson, there was room for greater latitude. It was possible that in the future treatment might be considerably delegated to callings ancillary to medicine which could usefully operate on their own lines under general medical guidance. A large share of maternity work was already done by registered midwives. The profession exercised a certain amount of control over them, but they still had considerable freedom of action. He would not refer to nurses; they stood alone and needed no argument; but he would be very sorry to try to do his work without them, for there were so many things that they could do better than he could. Still the profession maintained over them a coördinating control. There were already many other workers in the medical field—masseurs, operators of X rays and light treatment, bacteriologists—and if he found an osteopath with manipulative skill he would welcome his aid provided that proper diagnosis preceded treatment. There was no quarter from which the profession would not accept assistance in its proper sphere so long as it was conscientiously given. But to do good all methods of treatment must be coördinated under general medical guidance.

Evanescent Doctrines and Therapeutics.

The profession must have an open mind, but it was part of its duty to protect the public from exploitation by stunts and fancies, even those which were honestly put forward. These stunts were always rising and setting, and in spite of constant failure, people recommended them in the most light-hearted manner without any apparent sense of responsibility. Each time it was announced that "further delay is criminal"; that "the medical profession is prejudiced against anything new"; that it has instituted "a sullen boycott": then follows a list of cases given up by doctors and cured by the new treatment. Deep in the human mind was implanted a belief in the miraculous, and everybody seemed to be striving for some short cut which would avoid the strait and narrow path of scientific endeavour.

Osteopathy had been so much in the public mind that it was desirable to say a word about it. In its practice it was manipulative, and was thus related to its forbear, bone-setting. Though the word bone-setting had been replaced by the term manipulative surgery, they meant the same thing, but not the same thing as osteopathy. The success of manipulative surgery depended on the use of gifted fingers, and in suitable cases such treatment was valuable. But accurate diagnosis was an essential preliminary. The doctor was not allowed to talk of his successes, but the manipulative surgeon had no such restraints. Was it to be supposed he talked of his failures? He would not be human if he did, but doctors knew that they were many. Human beings were not built in watertight compartments, and the most beautiful manipulation might be worse than useless if disease of the heart or lungs, a cerebral tumour, or gonorrhœa were the underlying cause of joint affections or of paralysis. Everyone was now trying to get control of disease more early, in its more curable stages, and hence diagnosis was of supreme importance. Undoubtedly the leading men in osteopathy were good manipulators, though the rank and file were bad. But good as their work might be they had no claim to be regarded as leaders and pioneers, and it was laughable to hear them proclaimed as such by the press. This country was the proud possessor of the greatest manipulative surgeon in the world, a man who had founded schools of manipulative surgery far and wide. Yet Sir Robert Jones's name was hardly ever mentioned, though he had more skill in his little finger than the osteopaths had in their bodies. The theory underlying osteopathy was that all diseases are due to displacements of vertebræ, and that all the remedies needed are manufactured in the body. Of course, it was sheer buffoonery; if it were true, it could be proved by X rays and by anatomical dissection. Osteopathy, moreover, already had its rival, chiropractic; whilst the very latest news was that a new heretical sect had been born under the name of napropathy. In a few weeks or months there would doubtless be a fresh addition to the succession of doctrines. How many was it proposed to recognise, and which?

The General Medical Council.

In conclusion, Lord Dawson turned to the General Medical Council. It was in the public interest that the profession of medicine, like that of law, should have control and discipline. The personnel of the Council would vary from time to time, and hence its interpretation of its duties would also vary. Disagreement with its decisions might beget criticism of the members, but it did not justify criticism of the Council as such. He could recall occasions when the House of Commons had represented a very reactionary policy. This policy had justified criticism of that House, but it had not led to criticism of the House of Commons as an institution. He himself disagreed with the General Medical Council in certain particulars, but that did not absolve him from his duty to obey its edicts; if he objected to these his proper course was to try to alter them. If people disobeyed everything they disagreed with, where would be the discipline in life? There were occasions when, for conscience sake, a man should defy authority. But anyone who did this should be very careful that his defiance was not associated with material gain to himself. Could that be said of all the recent offenders who were dealt with by the General Medical Council? Lord Dawson thought not. It had been said that laymen should be nominated to sit on the Council. To that he had no objection, provided that medicine was not the only profession singled out for this dilution. A doctor, he thought, would do excellent work on the Bar Council, and the Trades Union Council might usefully admit an outsider—nominated, he would suggest, by the Home Secretary.

In thanking the meeting for its patient hearing, Lord Dawson declared that good work in medicine was never easy, never theatrical, never plausible, and asked his audience to distrust alleged wonder-working short cuts. "Narrow is the way" was as true of the search for knowledge as for salvation. The profession, he believed, was really actuated by singleness of purpose and was trying to keep aglow the lamps of science and service for the public good.

DISCUSSION.

Colonel Aplin asked Lord Dawson to explain the relations between a doctor and a bone-setter called in to give his services after a diagnosis had been made.

Lord Dawson said that it would be impossible to treat on an intellectual equality any man who had not been through instruction in the basic sciences. In his limited sphere the bone-setter would be treated with the politeness due to a comrade, provided that he did not step outside what he did know.

Colonel Aplin asked whether Lord Dawson meant that no unqualified osteopath should be allowed to treat a patient unless the condition had first been diagnosed by a doctor.

Lord Dawson replied that it was not in contemplation to make the practice of the unqualified man illegal. The public could go to him whenever they liked; but the profession could only recognise him in the limited sphere already defined.

A Member asked whether the qualified doctor should be there at the time the treatment was given, to which Lord Dawson replied that there were individual differences. Some doctors took a more rigid view than others. If the osteopath was obviously honest according to his lights and was a colleague with whom the doctor could harmoniously work, he thought that he would be accepted as such. He could not say that all members of the profession would take up that attitude.

Mr. Neville asked whether the doctor would be charged with "covering" if he took the line just indicated.

Lord Dawson said that he was not prepared to lay down rulings, but in his opinion such a doctor would not be covering because he himself would be responsible for the treatment the patient was receiving. He would no more be covering than if he were employing a masseur or an unqualified expert in light therapy to carry out treatment which he himself had ordered and approved. Covering occurred when the initiative was taken by the unqualified man. It was dreadful that people should treat diseases of which they did not know the nature, and he would punish any doctor who countenanced that practice.

The Chairman asked Colonel N. King, Registrar of the General Medical Council, to speak on this matter of covering.

Colonel King said that Lord Dawson was correct in what he said. If a registered practitioner was responsible for the treatment, and took a patient to a masseur or a light specialist or anybody else, and said "I want a certain treatment given to this patient," covering would not arise, even if the doctor might not know exactly how to administer the treatment. But if the doctor were employed by the unqualified person, as Dr. Axham was employed by Sir Herbert Barker, the position would be totally different.

Mr. Peto said that supposing Lord Dawson had sent a patient to be treated by Sir Herbert Barker and an anæsthetic had been needed for the treatment, would Dr. Axham have committed any crime against the laws of the Medical Council by administering it?

Colonel King replied that if the patient were Lord Dawson's patient, and his treatment was on Lord Dawson's instructions, then Dr. Axham would have been acting under Lord Dawson's direction, and the position would have been different.

Mr. Peto, referring to Lord Dawson's remark that doctors were ready to learn from other people, said that when Sir Herbert Barker offered to demonstrate his methods at any hospital selected by the medical profession, he had been met with a refusal. Why had he not been allowed to demonstrate his methods and to do his operations for the benefit of young students or anyone else?

Lord Dawson replied that he would deprecate the young student being dragged into any of these controversial questions. He would like to see a written document setting forth the terms of this offer of Sir Herbert Barker's; he had never been able to discover it, though it was constantly referred to in the press. Some of his (Lord Dawson's) colleagues had shown a friendly spirit and tried to see the work of osteopaths, but so often there had been an evasion or an excuse. If such an offer were made it would be easy to arrange a demonstration. And there was another way open to Sir Herbert Barker. He was a man of skill and had been successful financially. His fees were often larger than those of the ordinary surgeon. Lord Dawson had always found it difficult to understand why Sir Herbert Barker had not followed the example of members of the profession by holding a clinic for the free treatment of poor people where those interested could come and see him at work.

Mr. Peto said that throughout the war Sir Herbert Barker's one wish was to treat soldiers, in suitable cases, gratuitously; but not until 1918 did the War Office give half-hearted permission for men to go to Barker or any other bone-setter at their own risk. He had received a letter from Sir Herbert Barker in which he said that if the profession had only pocketed their pride and professional dignity years ago and learned what he could teach, all would have been well, and much unhappy criticism would have been spared; and, more important than all, humanity would have been an enormous gainer. He would send to Lord Dawson a copy of Sir Herbert Barker's offer to demonstrate his methods.

Lord Dawson said that he was not concerned with the wisdom of the action of the War Office. If the principles he had laid down had been applied in that case—if, before Barker treated them, the patients had been diagnosed by a skilled diagnostician—he would have raised no difficulty.

Sir Martin Conway put forward a problem. If he went to his family physician, who diagnosed what was the matter, and if he then said that he would like to go to an osteopath for treatment, and if in spite of the doctor's opposition he went, and the osteopath's treatment required a general anæsthetic, would a qualified physician be covering if he gave the anæsthetic?

Lord Dawson replied that that was a technical point. The real answer was that the range of treatment had now widened enormously, and included every kind of manipulative and physical measure, and hence it was likely that the definition of covering might have to be modified. It was not a rigid regulation; its great purpose was to protect the public, and for their protection treatment could not be allowed unless it was preceded by skilled diagnosis.

Mr. Sydney Henn asked whether Lord Dawson would extend his strictures on methods of treatment devised by unqualified men to Mr. Spahlinger's treatment for tuberculosis.

Lord Dawson replied that it was difficult to be fair and just about the Spahlinger treatment, because the profession in a general way was not acquainted with the facts. They would be very glad to know them.

Lord Knutsford wished to remind Members of the House of Commons who favoured unqualified practice that they had forbidden it in regard to dentistry. The House had laid it down (and the Lords had acquiesced in the decision) that no unqualified man should operate on the mouth at all. He did not know why dentists were treated more hardly than members of the medical profession.

Lord Balfour of Burleigh said that one reason for uneasiness in the public mind was that there was no appeal from the decisions of the General Medical Council. Perhaps it might be advisable to provide for such an appeal.

Lord Dawson replied that on the question of an appeal he had an open mind. He was convinced that in the Council there was every intention to be fair and just. A legal assessor was present during the sittings, and he, the speaker, was satisfied that every man obtained justice.

The Chairman said that the opinion of the law officers, as prepared by Lord Justice Lopes and Lord Esher, was that it was only right that the profession should be judged by the profession. If an appeal were made to the Courts, it would be putting one profession under the judgment of another.

Sir Ellis Hume Williams pointed out that there was an appeal from one profession to another in the case of military law—namely, to the Judge-Advocate, who was a barrister. He asked what sort of practice napropathy was.

Lord Dawson replied that he had not been initiated into the mysteries of the cult, which attributed human ills to connective tissue. There was a constant succession of these cults. Unqualified practitioners who were left to themselves often suffered from ideas of grandeur, and made assertions of power which were very dangerous. That sort of thing could not be done in the profession; doctors had to place their proposals before their colleagues in scientific meetings, and in that way their vanity was kept down. He had watched a highly skilled masseur for years, and had seen him assume almost miraculous powers. He had, therefore, questioned him as follows: If there is an acute pain in the abdomen you can cure it in no time? Oh, yes! If the patient has had it only a few hours? Yes, certainly. If the patient has a temperature of 101°, would that make any difference? No. Or if he is vomiting? Oh, no—and so, step by step, he had led the masseur to declare that he could cure acute appendicitis by manipulations. That was the danger with people who had not had a rigid training.

Mr. Peto moved a cordial vote of thanks to Lord Dawson for his address.

FROM CAGLIOSTRO TO COUÉ:
IMAGINATION AS A METHOD OF TREATMENT.

Report of an Address by

DR. GUSTAVE MONOD.

Delivered at a Social Evening at the Royal Society of Medicine on March 1st.

Sir StClair Thomson, the President, received Fellows of the Royal Society of Medicine and their guests at a social evening in the Society's house, when Dr. Gustave Monod, of Vichy and Paris, gave an address on the above subject. After a few preliminary remarks upon the mechanism of suggestion, Dr. Monod illustrated his thesis from the lives of three men—of different centuries, professions, motives, and technique—who alike had reputation and success as healers: Cagliostro, charlatan of the eighteenth century; Gruby, physician of the nineteenth century; and Coué, pharmaceutical chemist of the twentieth century. He gave a vivid account of Cagliostro's life and wanderings, of his display of wealth, his claims to longevity, and of those qualities and those deceptions which led him to be called not a charlatan, but The Charlatan. With his programme for manufacturing gold and his healing panacea, he had become a speculator in human greed and the fear of death. Dr. Monod recalled Cagliostro's success in advertising his cures and the stories that were current about his miraculous powers. "Our consciousness of sanity and measure," he remarked, "is not easily overwhelmed, but is more vulnerable when we are possessed by emotions, by surprise, or even by the alertness of expectancy. This was the moment when Cagliostro loved to launch his attacks upon the astonished minds of his dupes." This "splendid rogue" might conceivably have deceived himself; but the fact for emphasis was that many of his cures were authentic. His cures were the basis of his success.

The story of Cagliostro was followed by an account of the technique of a practitioner whose name was unfamiliar to most of his audience.

Dr. David Gruby.

David Gruby was born in Hungary in 1811. He studied medicine in Vienna and London, and arrived in Paris in 1840. A scientist and a hard worker, he specialised in morbid and comparative anatomy. At first he gave private lectures, but later he was invited to fill the chair of the great Cuvier. Settling on the height of Montmartre, where he established an observatory, he concentrated on the new science of microphotography, and collected 35,000 pathological specimens and secured 3000 photographic proofs. His other interests were many and various. He studied the hoof of the horse experimentally so as to obviate the use of horse-shoes; he opened a free dispensary; he managed an ambulance during the war—an ambulance without either deaths or amputation. He was a pioneer in the aseptic treatment of wounds, employing cotton-wool. He was naturalised as a Frenchman by national gratitude for his services. The City of Paris thanked him officially. Three medals were struck in his honour; 23 learned societies considered themselves honoured in having his name either on their honorary or active list.

So much for the savant. What about the man himself? He was certainly original. His consulting-room was littered with books which were only dusted when they fell on the ground. The prevailing colour in the room was green, but of every conceivable tone. Another room was used as a garden; he covered the floor with zinc and planted a number of plants which he watered ceaselessly. The room was a muddy mess where everything putrefied and the excess water percolated through to the indignant tenant below. Gruby was accustomed to throw everything into his bedroom and he needed a tunnel to reach his bed. When the exigencies of space demanded that the bedstead be removed, he slept in his consulting-room on his armchair, which he prolonged by heaps of books. Every night he plastered himself with a thick layer of calf's fat and then enveloped himself in paper, with the idea of nourishing his skin. His morning toilet lasted for hours, for he was strong on bodily cleanliness. Gruby had no regular consulting hours. The higher a client was in the social scale the longer he had to wait. He was supremely indifferent when clients complained, and would often leave them and go off on his round of visits in his celebrated roofless coupé, drawn by an ancient unshod horse, baptised *Va nu pieds*.

So much for the man. What was the technique of this savant, this pioneer in scientific biology, who was also a sound physician? The note was perfect simplicity, but he knew how to appeal to his patient's imagination. His amused, somewhat stunned patients obeyed him blindly; Gruby drove his simple, commonplace devices into their subconscious minds with unerring skill. His clientele comprised most of the celebrities of Paris. His prescriptions have become legendary. His Latin was all his own. His powders were chalk. His mixtures were water. But his remedies were only efficacious when they were taken with varied details. Always, without exception, they must be taken at precisely the hour prescribed. The precise diet was also advised.

A rheumatic patient was advised to take three apples; one at 7 at the Arc de Triomphe, another at 7.20 in the Place de la Concorde, the third in the Trocadero Gardens at 8. That meant a brisk morning walk, and the treatment, needless to say, was successful. A nervous member of the Stock Exchange, with persistent migraine, was ordered to go to Versailles by the 12.30, to eat an orange, and to return by the 2.24 train. He was, in this way, induced to give up his daily excitement at the Bourse. A lady, who suffered from intractable insomnia—one of those who "do not sleep a wink"—was ordered to take a spoonful of his famous water every half hour during the night. The nurse had no difficulty with the first two or three doses. But when the fourth was presented, the indignant lady insisted on being allowed to sleep in peace. He was called to a paralysed patient. He found her immobilised in her armchair. "What oil do you use in the kitchen?" "Why, ordinary oil, I suppose." "Can I see it?" When the bottle was produced Gruby uncorked it and calmly began emptying it on the carpet. The patient jumped up: "Hang it all, that's a Persian rug." The rug was ruined—the lady cured. Gruby's therapy was based on the device of using the patient's imagination to reinforce his own pre-eminent common sense. His astonishing successes earned for him the odd title of the "derviche guérisseur." The two Alexander Dumas, Chopin, Ambroise Thomas, Liszt, and Georges Sand were among his clients.

The Technique of M. Coué.

The last half of Dr. Monod's paper was devoted to a dissertation on M. Coué, whom he described as Bernheim's disciple. Coué's craft, said Dr. Monod, consists in preparing a road, in making the path straight for the propulsion of concepts sufficiently potent to seize on the entire field of the subconscious mind. These ideas do not mature as a fruit of the will. They are unmistakably labelled with automatism. A simple phrase is repeated so rapidly that there is no time for reason to insinuate itself into the subconscient mind. *Ca passe*—repeated with the rhythm of a bee's wings. . . .

The logical cohesion of Coué's technique is striking. It is the unswerving applications of his principles in all their implications. But it is possible that he does not realise that in an atmosphere where bluff and stage management hold the world in their formidable grasp, his cheery good nature provides his patients with an astonishing and striking contrast. The more he repeats that he personally is of no importance the more he subjugates his hearers. The results that he obtains are, of course, the fruit of long experience. His public is won over as soon as he appears. He uses a

conversational tone and a simple vocabulary. He begins the reassurance of his audience by reading his correspondence, including expressions of gratitude for cures and strange requests. A woman writes that as she was one of his convinced disciples she had bought two Panama bonds, but in spite of all, the numbers had not won. Criticism is at once disarmed and everyone laughs. Then he states his principles in a few words and proceeds at once to apply them. He tests the suggestibility of his patients in asking them to squeeze their hands tightly and to say to themselves that they cannot possibly loosen them. This experiment is sure to succeed. The forcible contraction of the hands is obviously voluntary. "Imagine that you can't do it." This is the addition of imagination to will; they are not in opposition. And the expert Coué, like a pointsman on the railway, has switched on the train to another line without the passenger being aware of it. Henceforth he can lead them where he wishes. His will has been substituted for the patient's will. The sitting concludes with a short peroration, always the same, which M. Coué recites in a monotonous voice, after having requested his hearers to close their eyes. Many of them instinctively join their hands in prayer. It is a short homily of optimistic philosophy with a little digression sketching out a few hints on digestion on the standard of a kindergarten class. One is amazed to hear M. Coué finish up by counting one, two, three so prosaically. Everyone looks as if they were waiting for an Amen, because it must not be forgotten that his stage management is borrowed from ordinary cultural rites.

All this is very dull, is it not? Perhaps! But I must now show you that it is a most formidable and disconcerting discovery. This is not prayer; M. Coué goes directly for his purpose. No, this is not prayer; it is an answer to prayer. You can call it M. Coué's answer to the Lord's Prayer. You will have your daily bread and you will digest it perfectly. "Even if you have imperious reasons, real obstacles which give you pain and grief, you will be free." In other words, your trespasses are forgiven. "If you are assailed by evil thoughts, temptations, I wish them all to be swept from your imagination." This is equivalent to saying you will not be led into temptation and you will be delivered from evil. "O, M. Coué," wrote a worldly woman, "I would like to pray to you. You are God Himself." I am not surprised.

It is obvious that M. Coué addresses himself to a definite category of morbid conditions. Mythomaniacs are an immense class. We are all of us more or less the subjects of mythomania, even the healthy people at the foot of the scale. At the other extremity, when mythomania is carried to excess, it becomes a psychosis, a disease of the soul. Between these extremes are found, in a zone with indefinite frontiers, a vast number of unhappy beings, the vain, who are possessed by a passion for attracting attention to their exceptional situation. They are always playing a part; they lie so as to provide themselves with stage scenery. They lie by word and gesture; they lie in thought and in body; they lie to the world, and they lie to themselves. The real drama is that they lie to themselves. They are caught in their own traps. They imagine a whole complex of contractions, deafness, blindness, and pains and aches without end.

Here is Coué's clientele. His immediate results, it is true, appear remarkable. The word cure runs trippingly on their tongues. And all is so simple. Coué is like a visitor to a golf club to whom the game is explained. Why, says he, do you pay out good money and give yourself so much trouble and walk so far carrying so many clubs? I'll show you what to do. Taking the ball between his thumb and index finger he calmly places it in the eighteenth hole.

Limitations and Perils of Auto-Suggestion.

Dr. Monod continued to the following effect:—

A lesion is only curable by imagination if it has been produced by imagination. This law of reversibility is a general law in biology. Troubles complicating a lesion will disappear if they are imaginary and if th lesion be represented by 1 and the imaginary troubles by 99, then clearly the abolition of 99 per cent. of the total complex will be experienced as a miraculous result. But it is not a cure. Coué would say of a hernia: "The subconsciousness sees to it that the tear in the peritoneum heals up little by little." Actually the imagination can only suppress what it has added—pain, fatigue, anxiety—which is a great deal. The following is a quotation from Coué:—

> "The subconscient mind having accepted the idea that the fibroid must disappear, the brain orders the arteries which nourish it to contract. They do contract; they refuse their services, and as the fibroid is deprived of food it dies, dries, is reabsorbed, and disappears."

M. Coué admits that disease may be imaginary, but he has never told us that a cure may be imaginary. He says that his explanations are so simple that there are only two categories of people who do not understand him—imbeciles and those who refuse to understand. A third might be added—those who imagine that they understand. If you break a bone, says M. Coué, go to the hospital. Why does the brain not send the necessary orders to heal broken bones? Perhaps it is because X rays make such an irresistible appeal to reason. And no patient's imagination will refuse to yield to his indignation if there is a vicious union. M. Coué, it is clear, fights shy of controllable conditions, and here he shows the common sense with which he is so plentifully endowed. Unfortunately there are grounds for fearing that his disciples do not share his wisdom.

Everyone nowadays discusses medicine; it is so easy to be a healer. Overnight one may score over the ignorant oafs who have been at pains to work for a qualification. It is the strength of our would-be therapists that they know nothing. All doubts disappear from those who are amenable to Coué's influences, and all those small minds saturated with neighbourly love are mightily tempted; as also is the inevitable band of predatory exploiters which has always clustered round disease. M. Coué wishes us to concentrate on the good side of his method, but there are other aspects. He tells us that criminals are victims of auto-suggestion. Moreover, if the expectant heir repeats every morning: "I will sweeten Uncle Paul's coffee with arsenic," and Uncle Paul dies, there will be no peace. He will be torn by remorse. Can this also be charmed away? Perhaps not. M. Coué replies to one of his disciples: "You cannot possibly obtain relief in such a case as you describe, because, in this case the remorse really exists; it is a fact." Quite so. But is not a hernia also a fact?

The Lessons to be Learned.

And now to conclude. One point is incontestable; without operators, healers, there is no cure. Cagliostro, Gruby, and Coué used the same mechanism in different ways; and they did cure their patients. The second point is that their cases all belonged to a definite category of patients. A third is that each of these wizards chose a foreign country for his field of battle. The Sicilian and Austrian chose France, the Frenchman England and America. (It is noteworthy that Coué failed absolutely in Italy.)

I maintain strongly that no physician can afford to neglect any kind of successful therapy. What Coué has taught us is that we should measure our patient's suggestibility. We must add a psychological diagnosis to our ordinary diagnosis; one patient demands authority, another persuasion, a third is worthy to be our collaborator, our partner in the search for truth; and all of them need and are grateful for our sympathy. But I claim that we can do this quite simply. The replies to our ordinary questions suffice. It is easy to see if your patients' answers are or are not suggested by your questions.

Above all, harmful suggestions must not be given. We have recently seen a play in Paris called *The Triumph of Medicine*. It was an acrid and penetrating criticism of our art. A Dr. Knock elaborated a new formula: "a fit man is merely a sick man who doesn't know he is ill." And so, full of his design to

make money as soon as possible, he succeeded in persuading everyone in his village and in the neighbourhood that they were suffering from a highly variegated list of diseases. The walls of his consulting-room and his waiting-room were covered with coloured anatomical diagrams of pathological conditions. In a few weeks everyone succumbed and the inn was turned into a nursing-home.

Let us use good suggestions. Let the consulting-room suggest recovery rather than disease. What is the use of glass cupboards with shining instruments? They do not provide useful suggestions? Neither are unmeaning uncoördinated pieces of furniture suggesting a torture chamber to be recommended. Let us face facts as they are. Medicine was materialised when it made itself scientific. We have studied death rather than life. It is said that in America a physician has no need to see the patient; he has a number of reports from expensive specialists before him, and makes his decision from them. We must appeal to our patient's reason. Yet how often do we discuss the therapy of the mind with our students? Psychotherapy must be taught.

Why should we not profit by Coué's lessons? He gives us a lesson in medical history. Coué has pulled us up, and with a round turn we have gone back to pre-Hippocratic days. We have retrogressed into the period of magical incantations. *Everydayineverywav* is no more and no less than *Abracadabra* sung or hummed in modern English. And this is fashionable also, is it not? Tired out with the faultless order and serenity of the Ninth Symphony we fly to the primitive jazz of the negro as a salve for wearied minds.

Coué is absolute in his methods, and to my mind his greatest merit is supreme simplicity. In the troubled days we are to live in for the rest of our lives we must hold to our own ground and we must not imitate. These three healers are, above all, themselves—Cagliostro, the perfect rogue; Gruby, absolutely original; and Coué, who has succeeded because he pushes his principles to their logical limit. Coué does not even need to apply his principles; he lives them, and the rest follows as night follows the day.

Our therapy will, I venture to think, improve if we develop our personality. We do not need either to will or to imagine, we must be ourselves. Let us put our faith in our work. Let us put our hope into our therapy. Faith and hope, the foremost virtues. The third and greatest is charity.

MEDICINE AND THE LAW.

THE THREE YEAR SENTENCE.

IN presenting a recent criminal appeal (against the sentence of three years' imprisonment passed on Hayley Morriss) counsel contended that the decided cases showed that no one should be imprisoned in a local prison for more than two years; "the principle was that no man could endure being shut up with lack of exercise and fresh air for longer than two years." The accused had been sentenced to two years' imprisonment with hard labour on one charge and to an extra year without hard labour on another. In rejecting the appeal the Lord Chief Justice suggested that Parliament should remove what he called a blemish from our penal legislation and should provide for increased penalties—i.e., penal servitude—where a multiplicity of offences—not necessarily of a sexual nature—has been committed, and where punishment is at present limited to two years' imprisonment. Mr. Greaves-Lord's Criminal Justice (Increase of Penalties) Bill is the outcome of Lord Hewart's suggestion; it has quickly passed its second reading and has received Home Office approval. It briefly proposes that where a man is convicted of two or more offences punishable by imprisonment which might amount in the aggregate to three years or more, the court shall have power to sentence him to penal servitude.

English criminal law, if allowed time, adapts itself eventually to changes in public opinion, usually in the direction of lighter penalties. When the death sentence was no longer thought essential for a large number of offences, transportation found its way on to the statute book. When in turn the barbarity of transportation was recognised, penal servitude was evolved as a statutory substitute. Penal servitude was standardised as a punishment of the duration of three years or more. The Penal Servitude Act of 1891, which effected this standardisation, at the same time allowed a judge to award imprisonment (with or without hard labour) for a term not exceeding two years in cases which seemed not to merit penal servitude. Thus, by a kind of convention the internment of offenders became separated into two compartments—on the one hand imprisonment up to two years, on the other penal servitude for three years or more. Each had its own conditions of work, dietary, and confinement, and these were relatively so different that many convicted persons preferred—and would even implore judges to inflict—three years of the latter rather than two years of the former. Two years' hard labour was spoken of as almost a death sentence; five years' penal servitude was by comparison almost a healthful holiday. Doubtless, as Mr. Greaves-Lord said lately in Parliament, in the early days of imprisonment with hard labour, a man who was able to survive two years of it came out of prison completely broken. In upsetting a sentence of three years' imprisonment in the case of R. *v.* Goldstein in 1916, Lord Reading was unquestionably influenced by considerations of health. Now, however, it seems, conditions are entirely changed. The Home Secretary stated in the recent debate that, after watching men at work who were respectively serving terms of hard labour and of penal servitude, he is satisfied that there is no longer any difference between the two, and that the quantity and quality of the food is as good in the one case as in the other. If this is so, and if conditions are really the same in the two-year as in the three-year period, there seems no point in retaining the old distinction between imprisonment and penal servitude. The latter description has a harsh sound no longer appropriate. The old classification seems, in fact, to have become as obsolete and arbitrary as the distinction between felonies and misdemeanours, a mere matter of historical development to which the law still clings tenaciously.

LOCAL AUTHORITY'S POWER TO PROHIBIT MILK-SUPPLY.

Common sense triumphed over technicalities in The King *v.* Hale U.D.C. (*ex parte* Wright) reported in the *Times* of Feb. 24th. The question, said the Lord Chief Justice, was whether it was safe that milk should be distributed for human consumption from a farm where there was a cow which was "a sort of reservoir of potential diphtheria." The facts of the case were instructive. In December, 1924, an alarming outbreak of diphtheria occurred in Cheshire. The cause of infection was traced to a dairy. The milk was then traced to a farm in the area of the local authority of Bucklow. The medical officers of the Hale and Bucklow districts made prompt investigation and found six out of seven persons at the farm suffering from diphtheria. The patients were sent to hospital and the Hale council served a statutory notice (under Section 4 of the Infectious Diseases (Prevention) Act of 1890) calling upon the farmer to show cause why an order should not be made prohibiting any further supply of milk from his farm. The farmer was at the moment in hospital and his father-in-law consented on his behalf to the order, this being apparently the technical irregularity on which the farmer afterwards relied in court. A cow at the farm was found to have diphtheritic germs in a sore udder. The sore afterwards healed; the cow had a calf, and the cow's milk was free from germs; but the local authority was not satisfied that it was safe to remove the embargo so long as the cow, a potential source of diphtheria, remained on the farm. In the course of time (a year later, it was stated) the farmer applied to the courts for a *certiorari* to quash the order or a *mandamus*

to compel the local authority to withdraw it. He relied on the technical irregularity in omitting to comply strictly with the procedure under Section 4 of the 1890 Act, and he pointed out that the cow was now well. The local authority replied that it would remove the embargo if the cow were slaughtered, the loss involved by slaughter being apparently a matter of only £5. The farmer rejoined that the council had no right to impose a condition of slaughter; only the Minister of Agriculture could do so. Thus, for the sake of what counsel described as a certain "bovine obstinacy," law costs greatly in excess of the sum of £5 were incurred. The farmer lost his case and had to pay the costs. Lord Hewart said the irregularities on the part of the council were neither large nor comprehensive. It was not a case either for *certiorari* or for *mandamus*. The court refused to take the responsibility of deciding that, with this cow still upon the farm, the local authority should be compelled to permit the distribution of milk therefrom.

A QUESTION OF SURVIVORSHIP: MEDICAL EVIDENCE INCONCLUSIVE.

If two or more persons perish in a common calamity, and if the circumstances leave it uncertain which of them died first, the law will in future presume (for the purposes of title to property) that the deaths occurred in seniority, the younger surviving the older. This has been the position since the beginning of this year in consequence of the new Law of Property Act. Previously the law in England made no such presumption but examined the evidence and, in default of evidence, left the question of survivorship unanswered. What will perhaps be the last case under the old law has just been heard in the Probate Court. In a crash near Croydon in December, 1924, an aeroplane containing a pilot and seven passengers dived to earth nose foremost. The petrol tanks burst; a fierce fire broke out, and the whole party lost their lives. Among the passengers were a husband and wife. The husband, as it happened, was illegitimate, had made no will, and left no issue. If his wife could be proved to have survived him, she would take her share of his estate, and at her death her next-of-kin would benefit. If she did not survive him, the property went to the Crown. The wife's body was found underneath all the others. Her burns were chiefly post mortem and there was a head wound which had lacerated the left lobe of the brain. Dr. R. M. Brontë, who made a post-mortem examination, found extravasation of blood, indicating that the wound occurred before death. The husband's burns were mostly ante-mortem. He had a fractured pelvis and other injuries, but Dr. Brontë found no extravasation of blood in his case. The judge accepted this evidence but found it inconclusive. "I know," he said, "that these two persons were killed; that the skull of one was fractured in life; that the other had a fracture sustained after death; that both were burned while in life; and that both bodies were burned after death. At what period of time in the progress of the collapse of the machine they died, I do not know." Thus, in accordance with the law in force at the time, the judge left the question of survivorship unanswered for want of clearer evidence. The wife's next-of-kin failed to discharge the burden of proof which the law laid upon him, and the husband's estate was awarded to the Treasury. Lord Merrivale remarked that he had had every possible assistance from the medical men called on both sides, but he could not eliminate the doubt arising out of the series of possible causes of death—shock before burning, burning, shock upon impact with the ground, and injury by fracture occurring either before, or upon, or after impact with the ground.

THE Annual Oration of the Hunterian Society, entitled "The Private Practitioner as Pioneer in Preventive Medicine," has been printed as a booklet by the Oxford University Press, and is now on sale, price 1*s.* net.

NATIONAL HEALTH INSURANCE.

EXTENSIONS OF BENEFITS.—RECOMMENDATIONS OF THE ROYAL COMMISSION.

THE Report of the Royal Commission on National Health Insurance appears this week (H.M. Stationery Office, Cmd. 2596, 6*s.* 6*d.*). The Commission was appointed in July, 1924—

"to inquire into the scheme of National Health Insurance established by the National Health Insurance Acts, 1911-22, and to report what, if any, alterations, extensions, or developments should be made in regard to the scope of that scheme and the administration, financial, and medical arrangements set up under it."

The membership of the Committee consisted of Lord Lawrence of Kingsgate (Chairman), Sir John Anderson, Sir Humphry Rolleston, P.R.C.P., Sir Alfred Watson, Sir Arthur Worley, Sir Andrew Duncan, Mr. A. D. Besant, F.I.A., Mr. Fred Bramley (resigned March, 1925), Mr. James Cook, Mr. John Evans, Prof. Alexander Gray, Mr. William Jones, Mrs. F. N. Harrison Bell, Miss Gertrude Tuckwell, with Mr. E. Hackforth (secretary) and Mr. J. W. Peck (assistant secretary).

The Report itself is divided into a Majority Report (292 pages), a Minority Report (27 pages), and two appendices containing the reports of the Departmental Actuarial Committee and a list of persons and bodies by whom evidence was submitted. We comment in a leading article upon the general conclusions and recommendations of the Majority Committee; the latter summarises as follows the contemplated development of the health services and the directions in which extension is desirable.

CONTEMPLATED DEVELOPMENT OF THE HEALTH SERVICES.

The various medical services organised by the State will continue to expand both in their scope and in the range of persons to whom they apply. These services should be maintained in close relationship with each other, both at the centre and in their local administration. In considering any changes or developments in the Insurance Medical Service regard should always he had to the importance of the fullest possible coördination with other health services.

Medical benefit has been a valued and successful element in the scheme of National Health Insurance. While it has been inevitable hitherto that medical benefit should be confined to a general practitioners' service, this limitation has detracted from the value of the benefit and its removal is urgently desirable. The additional benefits of a treatment character have been, on the whole, successful and appreciated, though in varying degrees, but they suffer from the following defects inherent in the conditions under which they are provided:—

(*a*) They are only available for those insured persons who are members of societies having surpluses at valuation, and only for those members who fulfil certain qualifying conditions, and that consequently large classes of insured persons are debarred from participating in these valuable services.

(*b*) Even among the societies giving a particular type of treatment benefit there is no uniformity in the content of the benefit, with the result that there is widespread confusion in the minds of the insured persons as to what precisely their rights are.

(*c*) The arrangements made between societies and professional bodies are wanting in authority and uniformity, and in some cases are accompanied by undesirable conditions.

It is desirable that, as soon as funds are available, the scope of maternity benefit should be expanded to cover medical and midwifery services in addition to a cash payment; that the service element should then be administered by the local health authorities and be coördinated with the other local medical services; and that a cash element should be retained and be administered in connexion with the other cash benefits.

RECOMMENDED EXTENSIONS OF BENEFITS.

The extensions of statutory benefits, to be made as and when funds are available to meet the cost, should be placed in the following order of priority :—

(*a*) Extension of the scope of medical benefit.

(*b*) Provision of allowances in respect of dependants of insured persons in receipt of sickness or disablement benefit.

(*c*) Improved provision at the time of pregnancy and childbirth for insured women and the wives of insured men.

(*d*) Provision of dental treatment as a normal benefit.

Medical Benefit.

The extension of the scope of medical benefit should take the form of the provision of

(*a*) expert medical advice and treatment for persons who can travel to meet the specialist ;

(*b*) expert advice for persons who are unable to travel ;

(*c*) laboratory services ;

but in-patient treatment in hospitals, major operations in the home, maternity services, and dental services should not be included at present.

The extended service should be provided not by way of development of the out-patient work of the hospitals, but through an independent scheme organised, under the general direction of the Ministry, throughout the whole country by the insurance committees or their successors, as an integral part of medical benefit.

Provision should be made in the scheme for the closest coöperation between the general practitioners and the specialists, particularly for the exchange of information as to cases and for the giving of definite guidance to the general practitioner as to both diagnosis and treatment.

Any practitioner possessing the requisite qualifications should be entitled to take part in the work, and the decision as to whether particular practitioners possess these qualifications should lie in the hands of a mixed lay and medical committee for each area.

In the initial stages of the scheme arrangements might be made for patients who are able to travel to attend either at the specialist's consulting-rooms or at the out-patient departments of hospitals, or at clinics established by the local administrative authority, as may be found most convenient in various areas.

The scheme of extended medical benefit could be financed through the funds made available under a scheme of pooling of surpluses.

Ophthalmic benefit should be recognised as part of the expert out-patient service under the scheme, and should not be available except on the recommendation of a medical practitioner.

Sickness Benefit.

An increase in some form of the normal cash benefit payable during incapacity for work is very desirable. For financial reasons this increase must at present be limited to an allowance in respect of dependants, where sickness or disablement benefit is payable, on the following lines :

(*a*) An addition to the sickness benefit of 2*s*. a week in respect of each dependant.

(*b*) An addition to the disablement benefit of 1*s*. a week in respect of each dependant.

(*c*) The dependants' allowance should be paid in all cases of incapacity of an insured married man even where the wife is herself a wage earner.

(*d*) The dependants' allowance in respect of dependent children should only be paid from the husband's insurance, not from the wife's.

(*e*) The dependants for the purposes of the scheme should normally be the wife and the children up to 14 years of age, but in order to meet the case of the widower with dependent children, an additional 2*s*. in the case of sickness benefit and 1*s*. in the case of disablement benefit should be paid in such case.

(*f*) In the case of the insured widow with dependent children, the allowance should be paid only in respect of the children and no additions similar to those in (*e*) should be made thereto.

(*g*) In the case of the insured woman whose husband is uninsured, no allowances in respect of dependent children should be paid from the woman's insurance.

(*h*) In the case of unmarried insured women, no allowances should be paid in respect of dependent children, but additions at the rates of 2*s*. to sickness benefit and 1*s*. to disablement benefit should be paid in respect of a widowed mother living with the insured person and not having sons to whom she can look for support.

Other Benefits.

No change should at present be made in the existing provision for maternity under the insurance scheme.

While a complete dental service available to the whole insured population would be an eminently desirable addition to the insurance scheme, no such change is financially practicable at present, and therefore the general arrangements for dental services under additional benefit schemes should be continued.

In order to secure more uniformity in, and effective supervision of, these services a regional dental staff should be instituted in a form that may be appropriately expanded when a statutory dental benefit is feasible ; and a substantial proportion of the cost of the regional dental staff should be borne by the approved societies providing dental benefit.

Owing to considerations arising from a survey of the development of the various medical services provided or supervised by the State, and having regard to the very large cost involved, no extension in the direction of provision of medical benefit for the dependants of insured persons should be made.

ADMINISTRATION OF MEDICAL BENEFIT.

The Commission recommends that Insurance Committees be abolished and their powers and duties transferred to committees of the appropriate local authorities, such committees to contain possibly a proportion of coöpted members.

In regard to the remuneration and control of insurance practitioners, the Commission recommends that the capitation method of remuneration of the insurance practitioners be continued as the normal method, but that the attendance method be retained as an alternative for adoption in particular areas when so desired. It is desirable, they think, that any settlement of the rate of remuneration of the insurance practitioners should be made valid over a reasonable period of years, so as to avoid financial uncertainty to both the contracting parties. The existing machinery for regulating admission to and removal from the medical panel, and for dealing with complaints as to the conduct of practitioners, chemists, and patients is held to be necessary and to operate fairly. This machinery should be continued generally in its present form, except that where, on an inquiry resulting from representations that an insurance practitioner should be removed from the panel, it is decided that such removal is not justified, the practitioner should be given an opportunity of a further hearing before any lesser penalty is imposed by the Minister.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

Athletics and Cardiac Lesions.

DURING recent years military inspection of young recruits has revealed the frequency of heart lesions traceable to over-indulgence in athletics and competitive contests, especially without adequate preparation. Such cases, according to recent reports, are diminishing in number, and it appears that in France sports and athletics are being practised on a saner physiological basis than formerly.

Protection of the New-born against Tuberculosis.

Prof. Calmette has just reported to the Académie de Médecine on the results of his investigations in collaboration with other workers at the Pasteur Institute on the protection of the new-born against tuberculosis by means of the vaccine known as B.C.G. (Vaccin Bilié Calmette Guérin). His experi-

mental research, it may be recalled, has established the following facts: (1) Immunity against infection or reinfection with tuberculosis can only be produced by preliminary inoculation of sensitive individuals with living bacilli. (2) To ensure that the organisms used for this inoculation are tolerated by the lymphatic tissues and do not form tuberculous lesions, they must be of a strain which in the course of generations has been deprived of the power of forming tubercles and which cannot recover that power even in favourable circumstances. It is necessary, of course, that the bacilli should keep their antigenic properties and should still be able to produce tuberculins. (3) It is only possible to forearm those subjects which have not been exposed to any previous infection. (4) Protection can be afforded either by inoculation of B.C.G. or by its administration by the mouth. (5) In this country, which has long been civilised, infection is so widespread that inoculation should be done during the first ten days of life.

Prof. Calmette's investigations have been made on more than 5000 children in France, 117 in Belgium, 3352 in Indo-China, and 218 in Senegal; so that they cover many different races. Whereas the mortality from tuberculosis amongst European children up to 1 year of age brought up in infected households is never less than 25 per cent. (in Paris it is 32·6 per cent.), the death-rate amongst those treated with B.C.G. vaccine is less than 2 per cent. The treatment thus saves at least 92 per cent. of the children who would otherwise die from tuberculosis in the first year of their lives. From the experimental data and observations collected during the past five years by Prof. Calmette it is now clear that this inoculation of the new-born is not only quite safe, but is also certainly effective. It therefore seems desirable to encourage its use by doctors and to recommend its employment above all in families in which the children are exposed to infection. The immunity conferred by the vaccine appears to last from 15–18 months, and it is desirable that re-vaccination should be done towards the end of the first and of the third years. It goes without saying that the treatment does not permit of any relaxation of the hygienic precautions intended to prevent massive infection of the young.

Testing Sanocrysin.

Calmette, Bernard, Bezançon, and other French investigators are testing sanocrysin in tuberculosis. Results have varied and it is stated that indications cannot yet be given precisely, though the preparation seems most useful in recent and progressing caseation. Sanocrysin appears to modify the lesions; its specific effect is rather doubtful and its action variable, so that conclusions on its therapeutic value are not yet warranted.

Death following Antitetanic Injection.

Deroide, of Calais, reports the rapid death of a 5-year-old girl following a single subcutaneous injection of antitetanic serum. The serum, injected prophylactically 24 hours after wounding of the foot by a nail, was prepared by the Pasteur Institute. The label stated that it would be effective until October, 1926. One or two minutes after receiving the serum the patient made convulsive movements, evinced distress at the throat, and rapidly collapsed. All emergency measures, including intracardiac injection of adrenalin, were vain. This case appears to be the first of its kind. The patient had never previously received parenterally any foreign protein. The case will draw renewed attention to the Besredka method of preventing anaphylactic shock by giving progressively increasing injections.

At the Paris Ophthalmological Society Valude and Autrevoix recently showed a case of ocular tuberculosis coming on in a child of 6 months, who died of meningitis three months later. The ocular lesion was supposed to be a tumour, until enucleation revealed extensive tuberculous infection. The lens and its ligaments were the only unaffected structures, and lesions were particularly marked in the uveal tract, retina, and optic nerve. The youngest case of ocular tuberculosis hitherto reported was aged 18 months.

Berthelot, Risler, and Foveau de Courmelles have just reported to the Académie des Sciences several cases of injury occasioned by ultra-violet rays. These injuries have occurred in persons making spectroscopic tests and in blowers of the glass bulbs used for incandescent lamps. Lamps having very thin walls may allow the ultra-violet rays to filter through. The lesions generally produced are painful erythemas and conjunctivitis.

Mouriquand has just transmitted to the Académie des Sciences, through Prof. Widal, a communication showing that a maize diet is not alone a sufficient cause for pellagra; it must coexist with poverty and under-nourishment. This opinion largely supports that advanced by Goldberger and his associates.

Correspondence.

"Audi alteram partem."

HAMILTON DRUMMOND MEMORIAL FUND.

To the Editor of THE LANCET.

SIR,—In your issue for Oct. 24th last you published a first list of subscribers to the above fund. Since that date further sums have been received or promised from those whose names follow, making in all a total of £533 17*s.* 6*d.*

Dr. C. N. Armstrong, Dr. Sarah B. Allen, Dr. Wm. Anderson, Dr. Paige Arnold.

Mr. I. Brumwell, Dr. H. S. Brown, Mr. W. Girling Ball, Dr. E. F. Bell, Mr. A. J. Blaxland, Dr. Leonard F. Browne, Dr. Percy Bennett, Dr. J. F. Bridge, Dr. Monica Bell, Dr. E. C. Braithwaite, Dr. Blench, Dr. Beaton, Mrs. G. F. Bengough.

Mr. H. W. Carson, Mr. Lionel Colledge, Miss Jessie D. Carr, Mr. Ralph Carr, Dr. J. F. Crombie, Mr. F. G. H. Clayton, Mrs. F. G. H. Clayton.

Dr. Alfred Duke, Mr. Sydney Dunstan, Dr. K. S. Dickinson, Dr. R. Leslie Dagger, Mr. Fred E. Dotchin.

Dr. Robt. Forsyth, Dr. S. B. Fox, Dr. C. B. Fox, Dr. H. N. Fletcher, Prof. John Fraser.

Dr. C. N. Gover, Dr. Helen Gurney, Dr. John Galloway, Mr. Gordon Gordon-Taylor.

Prof. Howden, Prof. W. D. Halliburton, Dr. P. Henderson, Dr. J. Berry Haycraft, Dr. Jas. Hudson, Dr. W. A. Hewitson, Dr. Hobbs, Dr. Willmot Holmes, Mr. C. W. M. Hope, Dr. R. S. Hindmarch, Dr. Phyllis Herbertson.

Dr. J. Stanley Johnson, Dr. Maurice E. Jones.

Mr. and Mrs. Kirkbride.

Dr. Leathart, Dr. W. E. C. Lunn.

Mr. R. G. E. Mortimer, Mrs. Morel, Mr. J. McGregor, Sir Berkeley Moynihan, Mr. Geo. Mason, Dr. A. C. H. McCullagh, Dr. J. W. McNee, Dr. Wm. Mackenzie.

Sister Nichol.

Dr. Walkinshaw Osselton.

Dr. Ivan Pirrie, Mrs. Pirrie, Mr. W. Mark Pybus, Miss A. M. Parsons, Dr. G. Newton Pitt.

Mr. R. Russell, Dr. Amy Robinson, Royal Victoria Infirmary (Resident Medical Staff, Miss Brown (matron), Assistant Matron and Nurses, Lay Staff).

Mrs. R. E. E. Spencer, Dr. Wm. Seymour, Mrs. Shiel, Miss Shiel, Dr. Una Swanston, Dr. F. W. Sinclair, Mr. Fred E. Schofield, Mr. G. G. Shiel, Dr. T. E. Stoker, Mr. Fred Straker, Dr. J. A. Stobbs.

"Thankful Helper," Dr. W. A. Tweddle.

Sister Whitfield, Dr. Olive Wilson, Prof. P. D. Wilkie, Dr. G. J. Williams, Sir Cuthbert Wallace.

In addition a sum of over £286 has been subscribed by past and present officers of the Northumberland Yeomanry. Doubtless there are still many others who will wish to join in this tribute, and the Committee will be glad if they will do so at once. Individual subscriptions for any amount not exceeding five guineas may be sent to the treasurers: Prof. R. P. Ranken Lyle, at 11, Osborne-terrance, or to Mr. Philip E. Noble, at Lloyds Bank, Grey-street, or direct to me at The Hawthorns, Osborne-road, all in Newcastle-upon-Tyne.

I am, Sir, yours faithfully,

G. GREY TURNER,
Convenor of Committee.

March 1st, 1926.

FREEDOM RESEARCH FUND AT THE LONDON HOSPITAL.

To the Editor of THE LANCET.

SIR,—In August last a gentleman, who desired to remain anonymous, called here and stated that he wished to make a gift for some charitable purpose and asked advice. We had many conversations and eventually he agreed with our suggestion that most good could be done by endowing medical research, which was badly handicapped in this country because there was little or no inducement for a man to take up research as a life-work. We pointed out the uncertainty of the pecuniary prospects of those who took up research work at the beginning of their careers and he agreed with our views.

We drew up a trust deed embodying points which we considered essential—namely: first, that the sum he intended to give should be invested in trustee securities; and secondly, that the income should be spent in salaries and not on bricks and mortar, and not in laboratory equipment.

Later the donor presented £50,000 in such a way that no one could possibly trace its source, and it has been invested.

The Fund, which is known as the Freedom Research Fund, is managed by a small committee of three persons—a nominee of the donor, the head of the clinical laboratory, and the house governor of the hospital—who meet fortnightly.

The researchers appointed have the following advantages: (1) They will work in very fine laboratories entirely on research work, but shoulder to shoulder with the hospital laboratory staff, who are doing the routine investigation work of the hospital. (2) They will be in touch with the clinical work of the hospital and especially with the "medical unit." (3) They will be working in a centre where unlimited clinical "material" may be found.

We hope to enlarge the Fund.

I am, Sir, yours faithfully,

E. W. MORRIS,
London Hospital, E., March 1st, 1926. House Governor.

THE MEDICAL EXAMINATION OF PASSENGERS TO AMERICA.

To the Editor of THE LANCET.

SIR,—The right to subject passengers landing on American soil to any form of medical examination cannot be denied. The procedure in 1924 and 1925 was interesting and instructive to myself, when I was present. Off Ellis Island the passengers were assembled and passed before the medical officer and other officials who were assisted by the ship's surgeons furnished with a complete list of passengers. On lying up at the quay the passengers were again assembled in the drawing-room. An American medical officer in uniform stood at a table; on the opposite side a steward, with a list of passengers. One by one we were called up. Coming at the end of the list, I had an excellent opportunity of observing the method employed. The medical officer had a small stick which he laid upon each eyelid and turned up the lids. Then the hands were held out for inspection, the spaces between the fingers being carefully scrutinised. During the examination of about one hundred first-class passengers, I noticed the medical officer dip his fingers in water twice and the stick once and wipe them on a towel: this seemed to leave something to be desired. The examination was obviously for trachoma and scabies. Some months later there was in the press an account of an action brought against the Ellis Island authorities on behalf of a lady who claimed to have contracted trachoma in one eye as a result of the examination.

I enclose my card, but my name is not for publication. I am, Sir, yours faithfully,

Feb. 25th, 1926. SURGEON.

TWO CASES OF EMPYEMA:

A CONTRAST AND A RECORD.

To the Editor of THE LANCET.

SIR,—These notes upon two cases are not presented as detailed clinical records, but the outlines are sufficiently full to permit comprehension of the facts.

CASE 1.—A woman in domestic service came under my care with the history that she had been ill for about a month with a pain on the right side just under the lower ribs. About the end of the first week of symptoms she called in a doctor, who continued to attend her for three weeks, but not feeling better she came home and I saw her. On examination I found the usual signs of pleuritic effusion on the right side and used the aspirator. This proceeding I repeated four times at intervals of about a week, evacuating on each occasion from 1 to 1½ pints of pus. Seeing that the case was not following a satisfactory course I advised a resection of a rib. The operation was quite satisfactory as to emptying the pleural cavity, but the after-treatment was tedious and very prolonged, and she is most probably an invalid for life.

CASE 2.—A man aged 35, a loose-jointed, flabby subject, came under my care a short time after Case No. 1. I found him suffering from all the symptoms of pneumonia on the left side; by the end of the first week he developed pleurisy with later effusion. After resort to the usual remedies for about a week I used the aspirator. I withdrew one pint of inodorous pus, and three days later I again used the aspirator and evacuated eight pints of pus at one sitting without, apparently, the least inconvenience to the patient. His temperature at that time, 103·6° F., fell to 100° and never again rose above it. From this point he made a rapid recovery, the heart regained its normal position, the respirations became natural, and the chest resonant all over; in three months, or a little more, from the beginning of his illness he resumed his employment. He is now a gardener doing real spade-work without effort, and a year later I found him a strong robust man.

In contrasting these cases I cannot resist the conviction that had the aspirator been resorted to at an earlier stage in Case No. 1 the woman would have had a reasonable prospect of permanent recovery. I think Case No. 2 goes a long way in support of this view. So far as I can ascertain, the evacuation of eight pints of pus at one sitting is a record performance in a case of empyema.

I am, Sir, yours faithfully,

J. CÆSAR, F.R.C.S.I.
Minster, Sheerness. Feb. 25th, 1926.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED FEB. 20TH, 1926.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 242 (last week 252); scarlet fever, 1825; diphtheria, 1165; enteric fever, 29; pneumonia, 1229; puerperal fever, 53; cerebro-spinal fever, 9; acute poliomyelitis, 2; encephalitis lethargica, 46; dysentery, 3; ophthalmia neonatorum, 99. There were no cases of cholera, plague, or typhus notified during the week.

Deaths.—In the aggregate of great towns, including London, there were 3 (1) deaths from enteric fever; none from small-pox; 116 (61) from measles; 13 (3) from scarlet fever; 65 (2) from whooping-cough; 50 (14) from diphtheria; 50 (9) from diarrhœa and enteritis under 2 years of age; and 76 (12) from influenza. The figures in parentheses are those for London itself.

ROYAL MANCHESTER CHILDREN'S HOSPITAL.—The ninety-sixth annual report shows that the management is faced with a heavy deficit (apart from the fact that £5029 is required for the new nurses' home), and this in spite of the fact that the ordinary income has been increased during the past few years. This implies the curtailment of valuable and necessary work and development. During the past year, as an experiment, accommodation has been provided for four private patients at fees ranging from 4 to 6 guineas a week. The arrangement does not reduce the number of ordinary beds and cots available, and it is thought that it may prove of benefit to many who are unable to pay heavy private nursing home fees, but wish to meet the full cost of hospital treatment. There was an increase in the number of patients treated during the year and also a marked decrease in the death-rate of the patients. A larger room and more lamps are to be provided for artificial sunlight treatment.

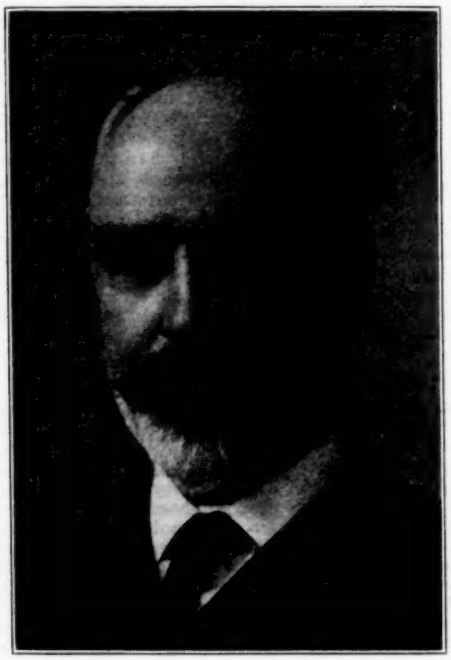
Obituary.

ARTHUR ROBERTSON CUSHNY, M.D. EDIN., M.A., LL.D. ABERD., F.R.S.,

PROFESSOR OF MATERIA MEDICA AND PHARMACOLOGY IN THE UNIVERSITY OF EDINBURGH.

BY the death of Prof. A. R. Cushny the medical world loses an outstanding member, for he was a scientific authority of the highest reputation, with much admirable and valuable research to his credit.

Born in 1866 at Speymouth, Morayshire, Arthur Robertson Cushny was the fourth son of the late Rev. John Cushny. He was educated in



PROF. A. R. CUSHNY.

[*Photograph by Moffat, Edinburgh.*

Aberdeen University, graduated M.A. in 1886 and M.B., C.M. in 1889, in which year he was the Thomson Fellow, and proceeded to the M.D. three years later. Thereupon he studied at Berne and Strassburg, and at the German University was appointed assistant to the professor of pharmacology in 1892–93. In the latter year he was elected professor of pharmacology in the University of Michigan, Ann Arbor, U.S.A., which post he retained till 1905, when he returned to this country on his appointment to the chair of Materia Medica and Pharmacology in the University of London. In London he remained till 1918 when he went to Edinburgh to succeed Sir Thomas Fraser. At Edinburgh he made considerable changes in his department, setting up an experimental laboratory and embarking with enthusiasm upon plans for the development of physiological research in its relations to pharmacology. These were in full development at the time of his sudden death.

The life work of a scientist may be considered under three aspects: First, the actual additions to knowledge made by him; secondly, his power to inspire in others a love of research and to direct the energy thus aroused along profitable channels; and thirdly, the influence he has on the general development of his science. Prof. Cushny had an important influence on English medical science in all of these respects. First, the contributions which he made to the knowledge of pharmacology were invaluable, for he was one of the first to analyse the mode of action of digitalis on the heart. After establishing the general principles by animal experiments, he, in collaboration with his friend, the late Sir James Mackenzie, carried out a series of observations on patients and showed the effect of the drug on the diseased heart. This fundamental work formed the basis for many of the important researches of Sir Thomas Lewis and others, who have during the past decade thrown so much light on the nature of heart disease. Prof. Cushny's work on diuretics also was notable, and in his monograph on the function of the kidney he brought forward the first coherent theory as to the mode of action of the kidney which at all accords with our modern knowledge of physical chemistry. Secondly, Prof. Cushny both in London and in Edinburgh showed that he had the power of inspiring research by others, and a number of the assistants whom he trained now hold posts in various parts of the Empire. He was a splendid trainer for young research workers, for he had an encyclopædic knowledge of his subject and also a very remarkable power of balanced judgment; to work under him was an education in accurate and scientific thought. Thirdly, the most significant aspect of Prof. Cushny's life work was the profound influence which he had on the development of pharmacology in this country. Unlike bacteriology, pharmacology did not start with a clear field, for our conceptions of the actions of drugs were (and are) distorted by all sorts of clinical traditions, some of them of great value and others mere relics of mediæval superstition. In the case of new drugs the search for the truth is hampered by the uncritical enthusiasm of those who are always seeking some new thing, and sometimes by commercial interests. Prof. Cushny's text-book, "Pharmacology and Therapeutics and the Action of Drugs," was the first comprehensive text-book of pharmacology to be published, and now in its eighth edition it is generally recognised as the most trustworthy and authoritative general text-book of its subject. It has had a profound influence on the development of pharmacology in this country and in America, for the author is severely critical, and has treated his subject as an exact science, refusing to admit as fact tradition unsupported by scientific evidence. This rigorous attitude, because it was based on wide knowledge and supported by an excellent power of judgment, has been of the greatest service to the science of pharmacology in its growth in difficult surroundings. His whole influence was directed towards making pharmacology an exact experimental science, which could serve as a secure foundation for the art of therapeutics. His work on digitalis in which he first determined the fundamental principles by experiment and later applied this knowledge to clinical practice is a model of the relation that he conceived should exist between pharmacology and therapeutics, but he always insisted that the essential duty of the pharmacologist was to get his data exactly correct, not permitting himself to be influenced by preconceived ideas as to what a drug was supposed to do.

Cushny was a frequent contributor to scientific literature and we have great reason to be grateful to him at THE LANCET. Latterly he was joint editor of the *Journal of Pharmacology and Experimental Therapeutics*, and his last written work will be found in a series of lectures which he gave in the summer of 1925 under the Charles E. Dohme Memorial Foundation before the Medical School of the Johns Hopkins University, Baltimore. His subject was the biological relations of optically isomeric substances, and these lectures are now in the press.

With such success as a teacher it was certain that his services would often be sought by educational boards, and at different times he examined in his subject at the Universities of Oxford, Cambridge,

London, Manchester, and Leeds, and also at the Conjoint Board of the English Colleges and at the entrance tests for the Indian Medical Service. He sat, also, on the Royal Commission on Whisky and other Potable Spirits in 1908, a Government inquiry which was much needed at a time when the trade in whisky was developing in a way that made the introduction of cheaply produced spirit a threat to public health.

Prof. Cushny's untimely death is an irreparable loss to English medical science, for he was for many years the senior pharmacologist engaged in research work in this country, and his strong personality made him the natural leader of his fellow scientists. He was still producing research work of first-rate importance, and his advice was being sought in all matters of general policy. To the medical school of Edinburgh his death is a particular blow; he always aimed at fostering the true scientific spirit amongst his students, who one and all as they worked with him esteemed him personally and felt the value of his encouragement and help.

Prof. Cushny's death came with great suddenness. He arrived home from London the day before his death, was taken ill during the night, and passed away on Feb. 25th at his home, Peffermill House, Edinburgh. He is survived by his wife and one daughter.

We have received the following tribute from Prof. W. E. Dixon, of Cambridge:—

"Prof. A. R. Cushny at the time of his death was the outstanding figure in pharmacology in this country. He was essentially a wise man, a man to whom one never appealed in vain for a valid criticism or an astute and considered opinion not only on all that pertained to the subject of which he was master, but on general principles in medicine, on questions of policy of organisation and education. His early training and the momentum which carried him through life was first derived from Oswald Schiedeberg, the founder of modern pharmacology, to whom Cushny acted for a time as assistant, and to whom he dedicated the early editions of his text-book, 'Dem Meister vom Schüller gewidmet.' The present generation have little understanding of the sacrifices which men like Cushny made to pursue their ideal. Nowadays, men fitted for research can obtain an ample wage, but in those days £100 per annum was affluence and it is small wonder that the few like Cushny, who for a time survive, leave a mark on history which is ineradicable. It was in Strassburg that his interest in cardiac irregularities and digitalis began, an interest which never ceased throughout life and which culminated in his book on digitalis published but recently. He first produced in animals the condition of auricular fibrillation and suggested that it was an unrecognised condition from which patients might suffer, but it was not till many years later that the condition was discovered in patients. His book on digitalis is essentially a description of the mechanism of the action of the drug on the mammalian heart; it is too modest in that, in his desire to be fair, Cushny lays too much stress on the work of other investigators, whilst the most valuable observations are those which were made or instigated by Cushny himself. Another great interest of Cushny throughout life was that of the kidney; he wrote many papers and finally a book on the subject. It is interesting to note that in one of his last papers he gave evidence for believing that caffeine acts as a diuretic by rendering the kidney more permeable to water just as phloridzin acts by making it more permeable to sugar, or phenyl carboxylic acid (atophan) by rendering it more permeable to uric acid. Another subject to which he gave a great deal of attention was the question of optically active isomers. He showed, for example, that the early specimens of synthetic adrenalin had only half the activity of the natural product, because the natural product consisted of the lævo-variety, whereas the synthetic substance was a mixture of equal parts of the two varieties. His experiments were continued with the hyoscyamines, hyoscines, nicotines, &c., in each case the activity occurring in only one isomer. Besides these he had many minor papers of interest; thus he drew attention to the convulsant action of the common nutmeg and showed that certain outbreaks of cirrhosis of the liver in cattle were due to senecio, a variety of groundsel.

"Cushny was a pioneer, he gave himself to pharmacology when it could not be said to exist in this country, long before it was known that the internal secretions largely governed the body's activity by means of alkaloidal-like substances. His work mainly consisted in investigating the mode of action of drugs, but his interest in the patient never ceased and in some of his researches he was associated with clinicians, the late Sir James Mackenzie, and others. Prof. Cushny just before his death was taking an active part for a reformed British Pharmacopœia; he regarded the Pharmacopœia as being edited on an entirely wrong principle which had tended to stereotype therapeutics on the lines of obsolete tradition with a resulting expenditure of money by the public on drugs of little or no value. Prof. Cushny possessed a great personality; it was only necessary to be with him to experience his wonderful charm and to understand how he inspired in his friends and pupils alike confidence and affection. It was to no small extent these qualities which enabled him to build a school of experimental pharmacology in Edinburgh. Cushny was a scholar, a teacher, and the best and most steadfast of friends; he passes to posterity as a pioneer of the science which he did so much to make, and leaves a great record of work of fundamental importance."

JOHN CAMERON YOUNG, M.D. GLASG.

THE death in Abyssinia of Dr. John Young, of Aden, closes the career of a great Scottish missionary. He had spent 32 years of his life in one of the most trying climates in the world. Yet he never spared himself and was never long off duty. From childhood he had learnt the meaning of hard work, for at the age of 10 he had to leave school to help earn his living. A few years later he was apprenticed to a joiner, and it was whilst working at this trade that he went through a religious experience which led him to attempt greater things. He made up his mind to be a missionary, and kept himself by vacation and evening work whilst studying medicine, arts, and theology at the University of Glasgow. Graduating as M.B., C.M. in 1882, he was appointed by the Free Church of Scotland to the mission of Sheikh Othman near Aden. Here he had to train his own staff of assistants—anæsthetist, dispenser, dresser—and for many years worked under great difficulties. In 1909 a hospital with nominally 100 beds was completed, the money for which he mainly raised himself; but soon this proved too small. Patients flocked from all parts of Southern Arabia and the annual list of operations mounted to more than 2000. Yet medical work was only part of Young's activities. At one time he took charge of the school, and some of his Arabian pupils distinguished themselves in after-life, though not many were converts. He acted as chaplain to the Presbyterian and Wesleyan troops of the Aden garrison, and during the war took charge of the European General Hospital, and was port health officer. "He was 'always a fighter,'" writes a colleague, "fighting the battles of the oppressed and helpless, fighting ignorance and disease, bad customs and habits, wrong beliefs. He was generous to a fault, sometimes overwhelmingly so, and no one had a kinder heart. In almost every country of the globe there are many who feel the world is poorer since John Young passed to his rest." Dr. Young was on holiday in Abyssinia for his health's sake when he died. But even there he was engaged in the work he loved, and he died, as he had wished, in harness.

Parliamentary Intelligence.

HOUSE OF COMMONS.

TUESDAY, FEB. 23RD.

War Pensions Administration.

Mr. WALSH called attention to war pensions administration, and moved "That a select committee be appointed to inquire into the general administration and practice of the Ministry of Pensions, with special reference to the questions of final and erroneous awards, parents', dependants', and widows' pensions, the regulations governing the appointment and powers of area war pensions committees, advisory councils, regional officers, and special grants committees, the seven years' limit for claims in respect of pensions for death or disability due to war service, and the advisability of appointing an independent court of medical appeal for the hearing of appeals against decisions of the entitlement and assessment appeals tribunals." He said he would like to suggest the appointment of an independent medical tribunal to take into consideration, free from all prejudice, free from all predilections, free as far as possible from all knowledge of what had gone before, the cases that have been submitted against the entitlement and assessment appeal tribunals. Like other Members he had had a good many cases submitted to him, and in the big majority he had found nothing but fair treatment from the Department, whoever had been the Minister at the time; but there had been many cases where men complained that the doctor who was upon the assessment tribunal and the doctor who attended upon the entitlement tribunal was the same doctor who sat daily on their appeal tribunal.

Lieut.-Colonel POWNALL moved the following amendment: "That, having regard to the prolonged consideration of all aspects of pensions administration in connexion with the Great War which has been given by select and other committees of inquiry and by this House itself, it would, in the opinion of this House, be undesirable that the settled fundamental principles of war pensions administration embodied in Royal Warrant and statute, which have been maintained by successive Parliaments and Governments in recent years, should be reopened and be again made the subject of formal inquiry by a select committee of this House." He said that by the proposal of Mr. Walsh they would upset the whole of the pensions administration, although the late Minister of Pensions had admitted that 85 per cent. of the cases were well met by the existing laws or regulations. The motion would raise false hopes in thousands and tens of thousands, and it might be hundreds of thousands, of those whose claims had been fully investigated by the Pensions Appeal Tribunal. This seemed to him to be very unfair. What the country wanted was not a select committee of inquiry; what was wanted now was security and stability. He would welcome a decision to stabilise the present rates for a further period of three years, and it might well be for another period after that. He would like to see the number of medical boards reduced.

Colonel CLIFTON BROWN seconded the amendment. As regards the medical boards no pressure in his experience was exercised on any doctor. When they were closing down cases, hard cases must arise, and the Ministry of Pensions, so far as he had followed its operations, had very wisely brought in a system of correction of errors. Any man who got worse was entitled to medical attention, and if it was found that any real mistake had been made—and he did not think that there were so many as some people thought—the error was corrected and the subsequent pension was adjusted to the state of health which the man had then reached. They must remember what wide effects the appointment of a select committee would have on ex-Service men throughout the country. There was no end to the time which it would occupy and no end to the number of cases which would be held up. As an ex-Service man who had spent three very happy years at the Ministry of Pensions, he thought that nothing could be more damaging to the interests of his fellow ex-Service men at the moment and to the whole administration of pensions than the appointment of a select committee. He hoped the House would resist the motion.

Major COHEN said it seemed to him rather a terrible thing that seven years after the war ended, when they were all satisfied that at any rate some ex-Service men were not getting all they ought to get, the House of Commons should be forced to a party division on a matter of this kind. It seemed to him that they wanted a little of the Locarno spirit in the House of Commons. He asked the Minister if he could not see his way to grant a select committee, at any rate to deal more generously and more kindly with the representative body of ex-Service men—he meant the British Legion. Very reluctantly he felt he must vote against the Government.

Mr. ELLIS DAVIES referred to the question of medical tribunals, and in particular appeal tribunals. It was essential that the gentlemen who, though members of the medical profession had, in fact, become Government officials, should not have the determining voice with regard to these pensions. He spoke with some experience of the Workmen's Compensation Act, and there were two diseases in which a good many mistakes were made—nervous disorder and heart disease. They were the two diseases of which the medical profession was at present most uncertain. Anyone who had to consult even a leading practitioner in London on either of those two diseases would be informed by those high authorities that with regard to nervous disorders and heart disease they were practically at sea even at the present day. These were the cases out of which most of the complaints with regard to medical tribunals arose. All these things showed the necessity for a thorough investigation into the conditions under which pensions were awarded.

Dr. DRUMMOND SHIELS said he found himself very much in sympathy with the remarks of Mr. Ellis Davies. The whole pensions system penalised the man who was plucky, the man who did not run to the field ambulance or the hospital on every occasion. A man might have worked, as many did, with heavy colds or chest complaints for months. He carried on and there was no entry in his medical sheet. He ultimately developed tuberculosis. His medical sheet was turned up and he was told "This was not contracted in the war because there is no record of your having been to the hospital with pleurisy or anything else." He wanted to put in a word for tuberculous ex-Service men who were not very satisfactorily treated in some ways. He put in a plea for the special diet allowance which they had some years ago. He supported the motion for a select committee.

Major TRYON (Minister of Pensions), replying to the debate, said that the overwhelming mass of corrections of errors took place through the normal channel; they were corrected when the men came up for treatment. There had been inquiry after inquiry and committee after committee, but the objection to upsetting all the work of the Pensions Department was that they could not now reopen all these questions. They could not change the system of compensation according to the extent of disablement to a system of final awards. If it was decided to appoint a select committee they would have to stop at once the granting of final pensions to a large number of men who to-day were passing from the realms of anxiety and uncertainty to the knowledge that their assessment was assured. They were not prepared to leave the matter to the risk of a select committee. It was not the policy of a Ministry to stand still. All through it had been the Ministry which had taken the initiative in reforms. It was the Ministry which introduced the Correction of Errors Board on their own initiative. They wanted to settle this question amicably and to give security to the pensioner. To give him that security they had stabilised his rates.

On a division the motion for the appointment of a select committee was rejected by 256 votes to 151. It being after 11 o'clock the debate on the amendment was "talked out."

WEDNESDAY, FEB. 24TH.

Ministry of Pensions Vote.

The House went into Committee of Supply on a vote of £1,492,000 for the salaries and expenses of the Ministry of Pensions, Mr. James Hope in the chair.

Lieut.-Colonel STANLEY (Parliamentary Secretary to the Ministry of Pensions) said that medical treatment, medical assessment of the disabled, the admission of claims, and the award of pensions, had proceeded without hindrance in accordance with the criteria laid down in the Royal Warrants, and if the cost had amounted to more than was estimated, the ex-Service men and their dependants had benefited. He thought that they were getting much nearer to accuracy of prognosis, but it was quite impossible to foretell with accuracy the operation during the year of very diverse factors. It was inevitable that a substantial minority of cases should still be found to be suffering from conditions that refused to yield to treatment, and that in some instances there should be a gradual deterioration. He referred in the main to the men suffering from such diseases as tuberculosis, chronic cases of acute bronchitis, organic heart disease, and paralysis. In such cases where a man was examined and found to be worse his pension had to be increased. But there was a very considerable off-set due to death and other causes. There was a large number of serious cases which must be provided for in hospitals, and some cases would always have to be so provided for. The excess expenditure on medical treatment was due entirely to the cost of treatment in hospitals being greater than was expected. The expenditure on other forms of treatment had declined. The number of out-patients during the past year had decreased, and that was a continuation of a process which had been going on for three years. There was also a decrease in the work of the medical examination of pensioners consequent on the increased stability of pensions. As a result there were fewer

doctors employed, and fewer men had to travel to the medical boards. This meant a decrease on the score of expenses.

Mr. SPENCER said that from his experience of medical boards he should have been very pleased to find that subhead of the vote swept away. In his opinion the medical boards had been a discredit to the Ministry and were among the worst institutions that had been set up. He knew of no body of men who differed more in their opinions regarding cases than the medical profession. The only board which could justly meet the requirements of all the people concerned would be a board in which the final decision was not given by medical men, but by some legal person who could weigh evidence after medical evidence had been given on both sides.

Dr. VERNON DAVIES said he was astonished to hear Mr. Spencer make such statements about the medical boards. He thought it was not in the interest of the pensioners to make them dissatisfied with the medical referees who were judging these cases. The hon. Member seemed quite prepared to accept the certificate of a panel practitioner, but when the same doctor was acting as a medical referee on behalf of the Ministry he seemed to think that the certificate must be wrong. Possibly it was wrong; doctors differed and disagreed, and when it came to an interpretation each man was entitled to his own opinion. But hon. Members who created dissatisfaction in the minds of the public with the decisions of these medical men were doing the pensioners a great disservice. Since the war a new state of mind had developed. If a man developed rheumatism six or seven years after war service it was said that that rheumatism must be due to war service; but people who had not been to the war developed rheumatism. Hon. Members should give medical men the credit for being honest in their opinions, and should try to convince the country that there were diseases with which the war had no connexion. Under the heading of Medical Treatment of Disabled Officers, Nurses, and Men, he noticed that the Minister was asking for an additional £216,000 which was roughly 10 per cent. of the original estimate. He should like a little more information why there had been this increase. One class of cases in which the Ministry might extend their efforts were the neurasthenia cases, which were becoming more and more troublesome and in some cases there were definite hardships.

Major TRYON (Minister of Pensions), replying to the debate, said that Dr. Vernon Davies had put the medical point of view in a speech which was of very great value, because it showed not only how difficult was the task of medical officers to deal with these questions, but it also brought home to the committee the obvious desire of the whole medical profession to deal fairly with cases of assessment and with pensions questions generally.

The vote was agreed to.

Tuberculosis in the Navy.

Sir BERTRAM FALLE asked the Parliamentary Secretary to the Admiralty the number of naval ratings who were invalided during the period Jan. 1st to Dec. 31st, 1925, with tuberculosis; and how many of the cases were considered to be attributable to service.—Mr. DAVIDSON replied: The total number of ratings invalided for tuberculosis in 1925 was 217; of these, three were found to be attributable to the Service.

Hospital Accommodation at Sarafand.

Mr. DAY asked the Secretary of State for Air whether the unsatisfactory hospital accommodation at Sarafand had yet been remedied, and in what manner.—Sir S. HOARE replied: The difficulties of hospital accommodation are being overcome by the conversion of existing buildings at Sarafand into a new hospital; the work is due for completion by March 31st next.

British Medical Association and Colonial Medical Appointments.

Mr. DAY asked the Secretary of State for the Colonies if he was aware of the manifesto issued by the British Medical Association in regard to the acceptance by doctors of colonial appointments; and whether he would reconsider the new regulations with a view to consultation with the Association.—Mr. AMERY replied: I have seen this announcement which arises out of regulations recently issued for the East African Medical Service, and which was published before I had had an opportunity of considering the representations which members of the medical staff in East Africa wished to make to me as to the effect of these regulations on officers already in the Service. I have now received and considered these representations and have reached certain decisions with regard to the points raised. I have intimated to the British Medical Association that I am prepared to receive a deputation from them.

THURSDAY, FEB. 25TH.

Miners and Nystagmus.

Mr. SPENCER asked the Home Secretary whether he was aware that nystagmus was on the increase among coal-miners; and whether he intended to give effect to the recommendation of the Medical Research Committee with regard to a higher standard of illumination by making it compulsory to provide the same.—Colonel LANE-FOX replied: The incidence of miners' nystagmus is still very heavy, but the total number of cases in 1924 was slightly less than in 1923; the number of new cases declined both in 1923 and 1924, and I hope will continue to do so. I expect before long to be able to fix a higher candle-power standard for flame safety-lamps. As regards electric safety-lamps, the present standard of candle-power is much higher than the standard for flame lamps, and I am advised that it is not yet practicable to raise it.

Death Certification.

Mr. DAY asked the Minister of Health if he would consider amendment to the Death Certification Act, so as to cause the compulsory examination of the body before a death certificate was issued by a medical practitioner.—Mr. NEVILLE CHAMBERLAIN replied: The subject of death certificates is already under my consideration with other related questions, but I cannot see my way in present circumstances to introduce any legislation.

Lunacy Reform Report.

Mr. DAY asked the Minister of Health when the Royal Commission on Lunacy Reform was likely to make its report.—Sir W. JOYNSON-HICKS replied: I understand that the Royal Commission hope to be able to present their report this summer, but it is not possible at present to give the precise date.

Grade A Milk and Pasteurised Milk.

Lieut.-Colonel FREMANTLE asked the Minister of Health the number of producers holding licences to sell Certified Grade A (tuberculin tested) and Grade A milk respectively; and the number of cows whose product was sold under each designation, respectively.—Mr. NEVILLE CHAMBERLAIN replied: The numbers of producers' licences for Certified and Grade A (tuberculin tested) milk in operation in England and Wales at the present time are 96 and 97 respectively. The number of such licences for Grade A milk on March 31st, 1925 (the latest date for which figures are available) was returned as 110. The numbers of cows in the herds producing the first two grades of milk are approximately 3500 and 3800 respectively. No precise information is available as to Grade A herds, but I am advised that the number of cows in such herds may be roughly estimated at 2000 to 2500.

Colonel FREMANTLE asked the Minister of Health the number of firms or persons licensed to sell pasteurised milk and the estimated quantity sold annually of such milk.—Mr. NEVILLE CHAMBERLAIN replied: Licences for the sale of pasteurised milk are issued by local authorities. The latest available returns are those of licences in force on March 31st, 1925, and they give the number of pasteurising establishments as 62 and of other premises licensed to distribute as 370. I have not complete information as to the total quantity of milk which is being sold in England and Wales at the present time as pasteurised, but I am advised that, on a rough estimate, it may be taken to be between 15 and 20 million gallons per annum.

Bovine Tuberculosis and Man.

Colonel FREMANTLE asked the Minister of Health if he had evidence that bovine tuberculosis is communicable to man by the consumption of tuberculous milk.—Mr. NEVILLE CHAMBERLAIN replied: Yes, Sir. I am advised that the positive conclusions of the Royal Commission on Tuberculosis on this subject have been confirmed by the subsequent work of many investigators at home and abroad.

Remuneration of Panel Practitioners.

Lieut.-Commander KENWORTHY asked the Minister of Health whether the remuneration withheld from insurance practitioners under the powers in that behalf contained in the National Health Insurance (Medical Benefit) Regulations, remained in the central fund for eventual distribution amongst insurance practitioners, or whether it was applied in any other direction; and, in the latter case, how it was dealt with.—Mr. NEVILLE CHAMBERLAIN replied: Sums withheld from insurance practitioners in the circumstances referred to are not returned to the central pool for distribution among practitioners, but are carried to a special fund from which, under Article 21 (2) of the regulations cited, payments are made to insurance committees towards meeting exceptional expenses incurred by them in the administration of medical benefit.

Blind Persons.

Mr. FRANK LEE asked the Minister of Health if he could give the number of blind persons in England, Scotland, and Wales; how many of these were between the ages of 50 and 70 years and receiving State pensions; how many councils, county or borough, had established workshops for the blind in their area; and how many persons were being trained or being found work therein.—Mr. NEVILLE CHAMBERLAIN replied: The number of blind persons in England and Wales on March 31st, 1925, was returned as 42,140. Of

these 15,048 were between the ages of 50 and 70, of whom 12,872 were on Sept. 30th last in receipt of pensions under Section 1 of the Blind Persons Act, 1920. Only three local authorities in England and Wales have found it necessary to establish workshops under this Act, providing employment for 22 blind persons, while the remainder of the local authorities contribute towards the workshops established by voluntary agencies which provide employment for 2200 blind persons.

Medical Officers and Cold Storage.

Mr. SPOOR asked the Minister of Health whether, in view of the situation about to be created by the prohibition of food preservatives, he would call for a return from medical officers of health indicating the extent, adequacy or otherwise of cold storage in their respective area; and what steps the Ministry proposed to take to encourage the use of refrigerators in the homes of consumers.—Mr. NEVILLE CHAMBERLAIN replied: I do not think it necessary to call for such a return as the hon. Member suggests, since information as to the cold storage accommodation of the country is already in the possession of the Government. As regards the second part of the question, I think that the hon. Member probably overestimates the extent to which the Preservatives Regulations will necessitate any increase in the facilities for domestic refrigeration in the home, and I do not propose to take any steps in the matter.

Insured Persons and Optical Benefit.

Mr. VIANT asked the Minister of Health (1) if he was aware that the proportion of refraction cases referred by some panel practitioners to ophthalmic surgeons was extraordinarily high, while the number so referred by other panel practitioners was exceedingly low; and whether he would issue instructions to such practitioners which would insure greater uniformity; and (2) if he was aware that many cases of refraction, where no ocular disease existed, were being referred to ophthalmic surgeons, thereby seriously depleting the surplus funds of approved societies unnecessarily; and if he would make regulations limiting the cases in which reference to ophthalmic surgeons was permitted.—Mr. NEVILLE CHAMBERLAIN replied: It is no part of the duty of an insurance practitioner to refer applicants for ophthalmic benefit to ophthalmic surgeons, but where the practitioner is of opinion that a patient is in need of ophthalmic treatment or optical appliances he gives him, if desired, a written recommendation to be forwarded to his approved society. It then rests with the society to decide whether the application for ophthalmic benefit is to be granted, and, if so, whether the payment that they will make is to cover the cost of examination or treatment by an ophthalmic surgeon. I know of no good reason for seeking to limit the discretion of societies in the manner suggested, and in any event I have at present no power to make regulations for such a purpose.

Mr. DAY asked if the Minister of Health would seek the powers that were necessary.

Sir K. WOOD: No, Sir. I have just said that it is thought better, at any rate at present, to keep the matter in the discretion of the approved societies.

Mr. RHYS DAVIES: Is the hon. gentleman not aware that the approved societies have no power to act in the way he has suggested, and in view of the fact that the Ministry of Health has no power to deal with the difficulty, will the Minister seek new powers?

Sir K. WOOD: I cannot agree with the hon. gentleman. I know that he has a great deal of knowledge upon this matter, but we are certainly advised that the approved societies themselves have the determination of this matter and are constantly doing so.

Mr. COMPTON: Is the hon. gentleman aware that the State auditors of the Department refused to sanction payments unless the medical certificate is produced in the first instance and the approved societies have no discretion in the matter?

Dr. VERNON DAVIES: Are we to understand that the approved societies consult the ophthalmic surgeons or the doctor in charge of the case?

Sir K. WOOD: I think it is generally done by consultation between the approved society and the doctor on the panel.

Small-pox in Durham.

Mr. WHITELEY asked the Minister of Health the number of notifications of small-pox in Durham county during the last four weeks; whether the necessary loans applied for had been granted in order to provide the essential equipment and staff to deal effectively with the cases; and whether there was any abatement of the epidemic.—Mr. NEVILLE CHAMBERLAIN replied: 665 cases of small-pox were notified in the county of Durham during the four weeks ended Feb. 20th. The application received from the county council for sanction to a loan is now under consideration. Fewer cases were notified last week than in any of the previous six weeks, but I am afraid that at present there are no signs of any substantial abatement of the epidemic.

Tuberculosis in the Air Force.

Dr. VERNON DAVIES asked the Secretary of State for Air if he had formed any opinion as to how the conditions of service had caused or contributed to the disease of pulmonary tuberculosis in the 17 officers and men who had been invalided out of the Service during the last three years for which records were available which had been decided as attributable to the conditions of service; if pensions had been granted these officers and men on account of their disability; and, if not, what compensation had been given them.—Sir S. HOARE replied: In answer to the first part of the question, it would not be practicable to state in general terms or otherwise than by detailed explanation of case by case to what conditions of Service the disabilities of the 17 officers and men referred to were attributable. Analysis of the cases, eight of which were attributable to service in the war, has failed to reveal any particular condition of service which can be regarded as a common causal or contributory factor. As regards the remaining parts of the question, in 16 cases pensions have already been awarded; the remaining case is under consideration.

Deaths from Small-pox.

Mr. SCRYMGEOUR asked the Minister of Health how many cases of small-pox had been notified in the country for the year 1925; how many deaths from small-pox had been registered; and whether any other cause of disease helped to cause the death in the fatal cases.—Mr. NEVILLE CHAMBERLAIN replied: 5365 cases of small-pox were notified in England and Wales during 1925, but this figure is subject to revision. Of the 9 deaths registered in which small-pox was entered on the death certificates, death was attributed solely to small-pox in three cases, while in the remaining six cases other causes were also entered on the death certificates.

FRIDAY, FEB. 26TH.

Births and Deaths Registration Bill.

Mr. TINNE, in moving the second reading of the Births and Deaths Registration Bill, said its object was to make more complete and effective the safeguards afforded by the law of registration in relation to the disposal of the dead with a view to eliminating as far as possible any risk or opportunity for the concealment of crime. Provision was made enabling local authorities to arrange in certain instances for the medical inspection of the body of a dead person and for regulating certain means of disposal. The Bill required still-births to be registered as an additional safeguard to infant life. An attempt had been made to remove one of the objections raised against previous Bills by eliminating the clause as to the universal medical inspection of bodies for burial. The new clause made it lawful for a county council, a county borough council, the Common Council of the City of London, or a metropolitan borough council, with the approval of the Minister of Health, to make arrangements that where a body had not been seen by a registered medical practitioner since death, the services of a registered medical pactitioner should be made available for verifying at the request of the coroner the death of anybody dying within the coroner's jurisdiction. The Bill contained nothing that was really controversial.

Lieut.-Colonel FREMANTLE traced the previous Parliamentary history of the subject, and said that the committee in 1893 recorded their conclusion that uncertified deaths should, as a class, cease to exist, and that means should be devised whereby a medical certificate should be obtained in every case. A Departmental Committee on the Law relating to Coroners reported in 1909 that the existing law as to death certification offered every opportunity of premature burial and every facility for the concealment of crime; that medical practitioners might certify merely on the information given by relatives; and that there was evidence that in many cases these certificates were carelessly and even recklessly given. Over and over again it had been shown that the cause of death was not completely notified in the certificate and that certificates gave a very inexact cause of death. Such a state of matters was dangerous from the point of view of possible carelessness giving shelter to crime and from the point of view of those who wanted to make those scientific statistics of disease from which so large an amount of legislation and administration was derived. For both reasons it was necessary to try to improve the certification of the cause of death. Each of the previous Bills with which he had been asociated contained proposals that every death should be verified by a certificate from a medical man who had inspected the body after death. The proposal was unnecessary from the point of view of the dead person or the relatives, and the cost would fall on public funds. The only way was to trust the medical man. In at least 999 cases out of 1000 the medical man did all that was necessary.

Sir KINGSLEY WOOD (Parliamentary Secretary to the Ministry of Health) commended the Bill to the favourable consideration of the House. The Bill, he said, would put an end to all irregularities under the present system. It

contained good machinery for preventing the surreptitious burial of a body under an authority which related to another body. A very important matter was that of still-births in which connexion a good deal of reform was needed. The requirement of the Bill that all such births should be registered would, he hoped, do much to prevent improper practices. The measure was a useful one, but it would need careful examination in committee.

Major-General Sir R. LUCE said that though fully agreeing with the objects of the Bill which were in every way commendable, it did not seem to him that the Bill had the merit of doing very much towards carrying out the objects it had in view. The chief object of the Bill should be to prevent any person being buried without proper knowledge of the immediate cause of death being available. Two reasons had been referred to. One was the prevention of crime and the other was the prevention of premature burial. The methods in the Bill to secure these objects seemed to him totally inadequate. For a long time there had been a general body of feeling that it was absolutely essential to prevent those things, that there should be a compulsory view of the body after death and before burial by a qualified person, but the method suggested in the Bill seemed totally inadequate. What was wanted was some method by which a body could be examined so as to certify that it was dead and that there was no obviously violent cause of death. No attempt had been made in this case to utilise the most valuable opportunity presented by the Bill to increase the scientific knowledge of the cause of death. It was quite true that in many cases the medical man did not give an absolutely complete account of the cause of death owing to his desire not to hurt the feelings of the relations. The only method suggested here to get over that difficulty was that the certificate should in future be sent direct to the registrar, but it would be the duty of the registrar as at present, if the relatives asked for it, to send them a copy of the certificate, so that there would be no difference made to the medical man and there would be no confidential relations between him and the registrar any more than at present. There was another omission in the Bill and that was the question of the relations of the medical practitioner and the coroner in cases in which there was a certain doubt as to the cause of death, or in which there was some question of violence or accident. There ought to be either in this Bill or in the Coroners Bill, which was already in the House of Lords, some arrangement by which it was definitely stated that in cases of doubt on the part of the medical man as to the cause of death, or in cases where he believed the death was due to violence or accident, it should be his duty to inform the coroner in order that the coroner might at once take up the case. In these cases it should not be the duty of the medical man to give a certificate of death, but the duty of the coroner. Perhaps many of these points were very difficult to get over without raising the question of expenditure of money. It was undoubted that if the medical man had to visit in all cases the body after death he would have to be paid to do so. If that were so, he quite realised that it would be difficult to get any amendment of the Bill that would produce these effects, which he thought were absolutely essential to any improvement in the Registration Act. At the same time, as these objects were partially brought forward in this Bill and in so far as he hoped it might not prejudice a more complete Bill in the future, he did not propose actually to oppose the Second Reading.

After further discussion the Bill was read a second time without a division.

MONDAY, MARCH 1ST.

Cost of Patients in Sanatoria.

Mr. NAYLOR asked the Minister of Health the average weekly cost per patient, including maintenance, medicines, medical attendance, laundry, &c., in sanatoria controlled by local authorities or other institutions recognised by his department.—Mr. N. CHAMBERLAIN replied: The average weekly cost per patient in institutions approved by my department for the treatment of tuberculosis was 49*s.* 4*d.* during the year ended March 31st, 1924, which is the last year for which complete figures are at present available.

After-effects of Juvenile Encephalitis.

Mr. COMPTON asked the Minister of Health whether any estimate could be given of the percentage of recoveries from juvenile encephalitis which had suffered mental or moral injury from that disease.—Mr. N. CHAMBERLAIN replied: I regret that at present there is not sufficient information available to enable such an estimate to be given.

League of Nations and Health.

Mr. GROVES asked the Minister of Health whether any report had been received by his department on the conference of members of the Health Committee of the League of Nations at The Hague on Jan. 4th to 7th; and whether the suggestions of the conference, as adopted, on the motion of Prof. Ricardo Jorge, would be carried out by his department.—Sir K. WOOD replied: My right hon. friend has received the report of the British delegate, but the suggestions of the conference have not yet been transmitted by the Health Committee of the League of Nations. As soon as these suggestions are received they will be referred for consideration to the Committee on Vaccination which was recently appointed.

Midwives and Maternity Homes Bill.

The Midwives and Maternity Homes Bill was read a second time.

TUESDAY, MARCH 2ND.

Encephalitis Lethargica.

Mr. AMMON asked the Minister of Health whether the Government was inclined to view favourably the offer received from Dr. Damoglou to place at the disposal of his Ministry a method of treatment of cases of encephalitis lethargica.—Sir K. WOOD replied: The answer is in the negative.

Nursing Homes Registration.

On the motion of Colonel GIBBS (Treasurer of the Household) a Select Committee was appointed to consider and inquire into the question of the inspection and supervision of nursing homes and to report what legislation, if any, was necessary or desirable for the purpose. Sir Cyril Cobb, Dr. Vernon Davies, Sir Leolin Forestier-Walker, Colonel Hurst, Sir Richard Luce, Mrs. Philipson, Major Price, Dr. Salter, Miss Wilkinson, and Mr. C. H. Wilson were nominated members of the Committee.

Medical News.

UNIVERSITY OF LONDON.—A meeting of the Senate was held on Feb. 24th, Prof. E. A. Gardner, the Vice-Chancellor, being in the chair.—Prof. C. A. Lovatt Evans F.R.S., was appointed to the Jodrell Chair of Physiology tenable at University College. Since March, 1922, he has been University Professor of Physiology at St. Bartholomew's Hospital Medical College. During this period he published Recent Advances in Physiology (1925) and was editor of Bainbridge and Menzies' "Essentials of Physiology" (1925).—Dr. G. V. Anrep was appointed to the University Readership in Physiology tenable at University College. He was educated at the University of Dorpat and at the Medical Faculty of the University of Petrograd. From 1917–20 he was senior assistant in physiology at the Institute of Experimental Medicine of Petrograd, and in 1920 he was appointed assistant and in 1923 senior assistant in physiology at University College, London. He has been awarded the Schäfer Prize and the Julius Mickle Fellowship (1924–25) for his research work in this University. His published work includes numerous articles in the *Journal of Physiology* (1912–25), Proceedings of the Royal Society (1923–25), and in *Heart*.—The title of Emeritus Professor of Obstetric Medicine at University College was conferred on Dr. H. R. Spencer.—The following were appointed Fellows of University College: Mr. James Thornton Carter, Prof. H. B. Fantham, Mr. Morris Ginsberg, Prof. Yaroslav Heyrovsky (of Prague), Dr. A. G. Levy, and Mr. G. Udny Yule, F.R.S.—The following were appointed Fellows of King's College: Sir James Kingston Fowler and Prof. William Wilson, F.R.S.—Dr. H. L. Eason has been reappointed as the representative of the University on the General Medical Council.

ROYAL NATIONAL ORTHOPÆDIC HOSPITAL.—A festival dinner in aid of the funds of this hospital was held at the Hotel Victoria, London, on Feb. 24th, when H.R.H. Prince Henry, the President of the institution, presided over a large gathering assembled to promote the fund for the provision of additional beds and of an extension of the out-patient department. Mr. Herbert West, chairman of the special committee appointed to organise the fund, stated that of the sum aimed at—namely, £87,500—£40,000 had already been received, with the result that the enlargement of the buildings in Great Portland-street was being undertaken, while it was hoped that, as further support came in, the first unit of the country branch at Brockley Hill could be proceeded with. Following on this statement Prince Henry, in proposing the toast of the hospital, pointed out the national importance of the work that it had already done since its foundation in 1838. At its central departments, both in-patient and out-patient in London, as also at its Stanmore branch in the country, the preventive and curative sides of orthopædic surgery were being steadily carried on, he said, by a medical staff which included many of the greatest names in orthopædic surgery. He laid stress

on the need for the development of the country branch, because continuous treatment was necessary in these cases, while in the open air the children enjoyed "all the natural sunshine which our climate permitted." He outlined the extensive nature of the activities of the hospital and stated that the need for school education concurrent with surgical treatment had been fully recognised, for the hospital had schools both at Great Portland-street and at the country branch, which were staffed by fully qualified and certified teachers. He concluded a clear exposition of the labours and deserts of the institution by an acknowledgment of the sympathetic coöperation which had been obtained from health and education authorities, from infant welfare workers, and from Red Cross. The Spanish Ambassador, who supported the toast, drew an eloquent analogy between the action of Christian kings, queens, and princes in the middles ages in their fights for the Cross to the crusades against disease now regularly led in Europe, and especially in England and Spain, by the Royal Houses and their scions. Mr. Reginald McKenna, treasurer of the hospital, responded to the toast with an ingenious suggestion that donations to the hospital were really investments, and other speakers included the Earl of Denbigh, the Bishop of St. Albans, Major-General J. E. B. Seely, and Sir Squire Sprigge. At the conclusion of the proceedings Prince Henry announced that £7500 had been subscribed at the dinner.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—On March 11th, at 5 P.M., in the lecture-room of the Medical Society, 11, Chandos-street, London, W., Colonel F. E. Fremantle will deliver a lecture on the Economics of Public Health. This lecture will be open to all members of the medical profession. On the same day, at 5 P.M., Mr. E. T. C. Milligan will give a special demonstration in clinical surgery at St. Mark's Hospital. This will be free to members of the Fellowship and holders of tickets for its general course. There will be a special course in gynæcology at the Chelsea Hospital for Women, beginning on March 8th and lasting for three weeks. Operations, lectures, and demonstrations will be given during the daily sessions. The daily afternoon demonstrations on the Diagnosis and Treatment of Diseases of the Eye continue throughout the week at the Royal Eye Hospital, beginning at 3 P.M. On March 15th the Hampstead General Hospital will begin an afternoon course (4.30–6) for the benefit of general practitioners. The daily sessions will include surgical and medical demonstrations and lectures, and the course will last for a fortnight. The London School of Tropical Medicine begins a series of eight clinical demonstrations on March 16th, which will continue for four weeks on Tuesdays and Thursdays at 2 P.M. Copies of all syllabuses, of the general course programme, and of the *Post-Graduate Medical Journal* may be had on application to the Secretary of the Fellowship, at 1, Wimpole-street, London, W. 1.

BRITISH PHARMACOPŒIA.—A conference took place on Feb. 23rd between the Pharmacopœia Committee of the General Medical Council and representatives of societies and public bodies interested in the revision of the Pharmacopœia. The following delegates were present: Dr. Smith Whitaker and Dr. A. W. Adams (Ministry of Health); Dr. H. H. Dale, F.R.S., and Lieut.-Colonel Sir David Prain, F.R.S. (Royal Society); Sir W. Hale-White and Prof. A. J. Clark (Royal Society of Medicine); Prof. T. R. Elliott, F.R.S., and Sir Walter Fletcher, F.R.S. (Medical Research Council); Dr. E. Lewis Lilley and Dr. J. W. Bone (British Medical Association); Mr. P. F. Rowsell and Mr. Edmond White (Pharmaceutical Society); Prof. A. R. Cushny, F.R.S. (since deceased), and Prof. W. E. Dixon, F.R.S. (Physiological Society); Prof. F. G. Donnan, F.R.S. (Chemical Society); Mr. A. B. Rendle, F.R.S., and Dr. A. T. Gage (Linnean Society); Mr. H. Todd and Mr. W. J. Hardy (Northern Ireland Pharmaceutical Society); Mr. G. A. McLean Lee and Mr. J. Smith (Southern Ireland Pharmaceutical Society); Mr. A. C. Chapman, F.R.S., and Mr. E. Hinks (Society of Public Analysts). The President outlined the history of the past issues of the British Pharmacopœia, and the present position as regards its revision. He mentioned that the Dominion of Canada had made a suggestion which might result in arrangements being made for the fuller consideration of special Canadian requirements, and said that it was probable that if anything was done on these lines similar arrangements would have to be made for ascertaining the special requirements of other parts of the overseas Dominions, such as India, Australia, and South Africa. The delegates from the societies brought forward certain proposals concerning the method of revision, and many suggestions on the subject were offered. At the conclusion of the conference the President stated that these proposals and suggestions would be carefully considered by the Pharmacopœia Committee at a meeting which would take place about the middle of March, after which he would ask the delegates to meet the Pharmacopœia Committee again.

ROYAL INSTITUTION.—On Friday, March 12th, Sir J. J. Thomson will lecture at 9 P.M. on Radiation from Electric Discharges.

IT is reported that Dr. R. Gordon Craig, of Sydney, has given £20,000 to found a Fellowship in Urology in the University of Sydney.

WEST KENT MEDICO-CHIRURGICAL SOCIETY.—A meeting of this society will be held at the Miller General Hospital, Greenwich, S.E., on Friday, March 12th, at 8.45 P.M., when Mr. C. A. Joll will read a paper on Modern Gastric Surgery.

ROYAL SOCIETY OF ARTS.—Amongst forthcoming lectures are three on Thermometry by Mr. W. F. Higgins, M.Sc., at 8 P.M., on March 15th, 22nd, and 29th, and one on Women and Children in Indian Industry, by Lady Chatterjee, D.Sc., on March 19th, at 4 P.M.

ROYAL SANITARY INSTITUTE.—A sessional meeting is to be held at the Town Hall, Hastings, on March 12th and 13th. On Friday, at 8 P.M., Prof. H. R. Kenwood will give a semi-popular lecture called a City of Health. On Saturday, at 10.30 A.M., a discussion on Mothercraft and Fathercraft will be opened by Dr. G. R. Bruce, Miss Hester Viney, and Dr. J. Fenton. School clinics, welfare centres, and other places of interest will be visited.

EPSOM COLLEGE.—The Council of Epsom College will shortly award a St. Anne's Home Scholarship of the value of £48 a year. Candidates must be between the ages of 7 and 12, and must be the orphan daughters of duly qualified medical men who have been for not less than five years in independent practice in England or Wales. Particulars can be obtained from the Secretary, at the office of the College, 49, Bedford-square, W.C. 1.

Among the works announced for publication this spring by Messrs. Martin, Hopkinson and Co., Ltd., is a book called "Medical Aspects of Birth Control," which contains contributions from Dr. R. C. Buist, Dr. Letitia Fairfield, Dr. Arthur Giles, Prof. Leonard Hill, F.R.S., Dr. Crichton-Miller, Sir Arthur Newsholme, Sir John Robertson, and Dr. Mary Scharlieb, and is edited by the Rev. Sir James Marchant.

UNIVERSITY OF BASLE: LECTURES BY PROF. BRAMWELL.—At the invitation of the University authorities Prof. Edwin Bramwell, of Edinburgh, gave a series of lectures before teachers and students between Feb. 15th and 27th. Selected Chapters of Neurology was his subject, and the lectures were greatly appreciated. Prof. Staehelin, of the Basle Medical Faculty, in a vote of thanks to Prof. Bramwell, remarked that science is international and that every worker has access to the scientific literature of other countries. But the scientists of different nations have different ways of approaching and solving their problems, and nothing is more interesting and fruitful than to observe scientific workers of other countries handling the problems of their own sphere. Prof. Bramwell impressed his audience with the feeling that much can be learnt and gained from the English outlook in clinical medicine.

"BRENTHOL H" AND A DYE-WORKER'S DEATH.—An adjourned inquiry into the cause of the death of James Lee (41), Rochdale, who was employed at a kid-glove dye-works, Middleton, was held on Feb. 24th by the coroner, Mr. W. W. Surridge, at the Manchester City Coroner's Court. The firm at which Lee worked used a substance known as "Brenthol H," and it was suggested that fumes arising from the mixture of this substance with soda used in the process of dyeing had affected Lee, who died at the Manchester Royal Infirmary on Feb. 7th. The post-mortem showed that death was due to toxic jaundice. No such case has hitherto been recorded. The coroner said that as there was not sufficient evidence to show what were the prevailing conditions which led to the man's death he would return an open verdict.

AMALGAMATION OF THE DUBLIN HOSPITALS.—At the annual meeting of the Incorporated Orthopædic Hospital of Ireland, Mr. R. C. B. Maunsell, President of the Royal College of Surgeons in Ireland, stated that the scheme for the amalgamation of at least five of the Dublin hospitals was in abeyance in consequence of difficulties created by the question of the Medical Register in the Free State. The Rockefeller Foundation was about to grant a large sum when this question arose and the negotiations were broken off pending a settlement. The five hospitals concerned—Sir Patrick Dun's, the Adelaide, Mercers', the Meath, and the City of Dublin—have agreed in principle to amalgamation and the erection of a new hospital of 750 beds at a cost of about £750,000. This would be 100 beds more than the present aggregate, and it is estimated that the existing institutions could be sold for £350,000.

The Hôpital des Enfants Malades, 149, rue de Sèvres, Paris, is to hold a special vacation course from April 7th to 17th on the Diseases of Children.

HAWICK COTTAGE HOSPITAL.—Lady Violet Astor has dedicated an additional wing which she has provided as a memorial to her brother, the Hon. G. W. E. Elliot, who was killed in action in 1917. The new wing, which will be used for orthopædic and electrical work, includes two private wards.

PRINTERS' CONVALESCENT HOME.—Lord Riddell on Feb. 20th opened the Hermitage Convalescent Home for the Printers' Medical Aid and Sanatoria Association at Hastings. The Association has been very active since 1909, and the income has grown beyond all optimistic expectation. For the extensive benefits offered the members pay only a penny a week. Last year there were 442 convalescent home cases and 79 sanatoria cases.

THE SITE OF BETHLEM HOSPITAL.—Subject to Parliamentary sanction, Lord Rothermere has purchased the site of Bethlem Hospital in Southwark for £155,000. The area of between 14 and 15 acres is to be converted into a playground and park to be known as the "Geraldine Mary Harmsworth Park" as a memorial of the late Mrs. Harmsworth, the mother of Lord Rothermere and the late Lord Northcliffe.

THE LATE DR. E. S. TRESIDDER.—The death of Dr. Edward Stanley Tresidder took place on Feb. 23rd at his residence at Askern, near Doncaster, in his sixty-seventh year. A student at Guy's Hospital, London, he qualified M.R.C.S. Eng. in 1882 and L.R.C.P. Lond. a year later. He had been in practice at Askern for about 12 years and had been divisional surgeon of the Askern Nursing Home since its inception in 1917. In recognition of an active interest in ambulance work stretching over more than 35 years, he was made an honorary associate of the Order of St. John of Jerusalem about two years ago. Dr. Tresidder was the second son of the late Surgeon-General J. N. Tresidder, I.M.S.

BRIGHTON, HOVE, AND PRESTON DISPENSARY.—With reference to the Hove branch, which is known as the Hove Hospital, it was stated at the annual meeting held recently that Mr. Bernhard Baron had given £2500 to defray the cost of a new wing, in memory of his wife. This probably meant an addition of ten beds, and the cost of running the hospital would be increased from £4000 a year to £5500 a year. Hove, with its population of 46,000, only subscribed £825 annually. For the institution as a whole the ordinary expenditure was in excess of the ordinary income by £804. Large increases of all classes of patients were recorded during the year.

SUSSEX MATERNITY AND WOMEN'S HOSPITAL.—This institution at Brighton is flourishing. Only a few years ago it removed from its old inadequate premises, and now, despite the opening of an additional ward, still further room is wanted. During 1925 238 women were treated as in-patients, 385 mothers received attention at childbirth, 3686 out-patients attended, 1796 examinations were made in the antenatal clinic, 1080 homes were visited by the nurses, 73 patients were accommodated in the separate wards for private maternity patients, and 55 were admitted into other wards at the Hove branch. The accounts show a strong financial position; the excess of income over expenditure in 1925 was £2490.

INTERNATIONAL SOCIETY OF MEDICAL HYDROLOGY. This year this society is to hold its annual meeting in Czecho-Slovakia from April 16th to 20th. A varied programme has been arranged, including visits to Karlsbad, Marienbad, Franzensbad, Pistyan, and the health resorts of the Tatra mountains. There will be papers and discussions, amongst others, on the following subjects: Endocrine Deficiency and Spa Treatment, Dr. M. Porges (Marienbad); the Treatment of Disorders of the Liver by Waters and Baths, Dr. Kraus and Dr. H. Simon (Karlsbad); the Balneological Treatment of High Blood Pressure, Dr. Pflanz (Marienbad); the Treatment of Chronic Rheumatic Affections by Mud Baths, Dr. L. Schmidt (Pistyan), Prof. A. Vinaj (Andorno), Prof. E. Astori (Abano), and Dr. E. Tommasi (Agnano); the Care of Medicinal Springs, Dr. Zörkendörfer (Franzensbad). The medical faculties of the Universities of Prague have arranged to receive the society, and the Czecho-Slovakian and other continental railways have offered concessions. Members of the medical profession other than members of the International Society will be made cordially welcome if they wish to join this study-tour to Czecho-Slovakia. Full particulars of the journey, programme, and facilities may be had from the hon. secretary, Dr. E. P. Poulton, at 36, Devonshire-place, London, W. 1.

MANCHESTER ROYAL INFIRMARY.—The post-graduate lectures at the Royal Infirmary for the second half of the year 1925–26 began on Tuesday, March 2nd, at 4.15 P.M., when Dr. F. Craven Moore lectured on the Diagnosis of Nephritis. From then until May 21st (except at Easter) there will be lectures by members of the Royal Infirmary staff on Tuesdays and demonstrations of clinical cases and of medical methods on Fridays.

MANCHESTER UNIVERSITY'S SHROVE TUESDAY "RAG." As a result of the University's Shrove Tuesday "rag" the Manchester and Salford Hospitals will receive this year about £11,000. The sums collected in previous years were £656 in 1922, £1033 in 1923, £2856 in 1924, £6023 in 1925. This year's collection exceeds the sum raised by the University of Glasgow, which was £10,560. The street collecting boxes yielded £6004, and the publication "Rag Rag" with its advertisements and sales realised £3700.

MANCHESTER NORTHERN HOSPITAL FOR WOMEN AND CHILDREN.—At the annual meeting it was stated that the number of in-patients during last year was 220 in excess of the previous year and also that the hospital was not in debt. The hospital is situated in the midst of an ever-growing and populous neighbourhood, and its present accommodation has become quite inadequate. It has been resolved to erect a new hospital at a cost of £150,000. A site covering 16,655 square yards has been given by the President, Sir Edward Holt, and plans for the new hospital have been prepared. There are now in the hospital 22 beds for women and 50 cots for children, and in the new building it is proposed to have 220 beds. Last year 1248 persons were treated in the wards and 4278 in the dispensary. Towards the £150,000 required the committee has accumulated over £35,000, and the general public will be appealed to for the remainder. Amongst the subscriptions received are £5000 from Sir Edward Holt, Bleachers' Association £2000, R. S. Bodington £1000, Groves and Whitnall Ltd. £1000, Lady Holt £1000, and W. Morton Philips £1000. Over £16,000 has been allocated from the general funds of the hospital.

THE LATE DR. J. DERHAM-REID.—Dr. James Derham-Reid, who died of pneumonia on Feb. 17th at the age of 47, had lived in Bolton nearly all his life and is said to have had one of the largest practices in Lancashire. He studied medicine at the Manchester Medical School and at the Middlesex Hospital, London, and after qualifying as M.R.C.S., L.R.C.P. in 1905, he practised for a time in Walkden. Then he moved to the Daubhill district of Bolton, where he became very popular. The affectionate esteem in which he was held by those who live in the district was shown in a remarkable and spontaneous manner at his funeral on Feb. 23rd. Representatives of all sides of the life of the neighbourhood began to assemble at the church an hour before the service began, and the blinds in the shops and houses in the neighbourhood were drawn. Dr. Derham-Reid joined the R.A.M.C. (Territorial Force) in 1915, was promoted to the rank of major, and won the Military Cross. He leaves a widow and six young children.

GLASGOW ROYAL CANCER HOSPITAL.—In the new X ray department elaborate precautions have been taken to counter the penetrative power of the Erlangen rays, and the walls of the X ray rooms have an ample coating of lead, which is not only the cheapest metal, but that which offers the greatest resistance to the penetrative rays. In the operator's room 17 lb. of lead per square foot are used as a lining from floor to ceiling, and in order that a patient may be kept under constant observation, windows of specially prepared glass of a high degree of protective power have been inserted. Sir G. T. Beatson, who has been surgeon to the hospital for over 30 years, has written an interesting pamphlet descriptive of the building.

THE LATE DR. J. A. SUTHERLAND.—The interment of Dr. John Alexander Sutherland took place at Cleckheaton Old Cemetery on Feb. 21st. Many medical colleagues were present and various institutions with which he was connected were represented, including the North Bierley Joint Hospital, of which he had been medical superintendent ever since its foundation, and the St. John Ambulance and Nursing Division Corps from Spen Valley. Graduating in medicine at the University of Edinburgh in 1878, Dr. Sutherland served as assistant surgeon in the Leith Hospital, and as house physician at the Royal Infirmary, Edinburgh. Besides being physician to the North Bierley Joint Hospital he was also medical officer of health for Cleckheaton. At the time of his death he was in his seventieth year. Dr. Sutherland has been described as "a typical Scotsman, who, despite his long residence in the West Riding, never entirely lost the accent of his native land." Well known to all in the Spen Valley, he was affectionately called "the old doctor," and his death will leave a big gap in the intimate life of the district.

PEMPHIGUS NEONATORUM.—The Ministry of Health has approved the resolution of the Manchester City Council ordering that pemphigus neonatorum be classed as a notifiable infectious disease from March 10th to June 30th of this year.

ST. THOMAS'S HOSPITAL.—Three popular lectures on physics are to be given at the hospital on March 9th, 23rd, and 30th, at 5 P.M. The first, on the Nature of Human Speech, will be given by Sir Richard Paget. Four lectures on the Importance of Vitamins are to be given on March 11th, 12th, 15th, and 16th, at 5 P.M., by Prof. R. H. A. Plimmer.

DONATIONS AND BEQUESTS.—Mr. Alfred Shuttleworth, of Eastgate House, Lincoln, left large bequests to servants and dependants, and £4000 to the Lincoln County Hospital, and £1000 to the Lincoln General Dispensary.—Major David Milne, Dundee, left £1000 each to the Royal Victoria Hospital, Dundee, and the Dundee Royal Infirmary, and £500 to the Dundee Sick Poor Nursing Society.

MIDDLESEX HOSPITAL.—A scientific exhibition and demonstration in the research departments of the hospital and medical school is to be held on Wednesday, March 10th, from 9 P.M. to 11.30. From that time until March 16th the exhibition of ultra-violet radiation apparatus and other electro-therapeutic apparatus in the evacuated wards of the hospital will remain open between 11 A.M. and 6 P.M. daily. Admission will be free, on presentation of a visiting card, to members of the profession and others directly interested.

CONFERENCE ON TUBERCULOSIS.—The Tuberculosis Society and the Society of Superintendents of Tuberculosis Institutions are to hold a joint meeting at Cambridge from March 25th to 27th. Amongst those who will give addresses are Dr. James Crockett, Dr. G. Marshall, Sir Humphry Rolleston, Sir StClair Thomson, Prof. Edgar Collis, Prof. Lyle Cummins, and Dr. H. de Carle Woodcock. A limited number of rooms is available at St. Catherine's College. Information may be had from Dr. F. J. Blackmore, Tuberculosis Dispensary, Maxey-road, Plumstead, S.E. 18.

VENEREAL DISEASE AND THE MERCHANT SERVICE.—The British Social Hygiene Council held a conference on Feb. 25th on the welfare of the mercantile marine in the Port of London, with special reference to the provision of facilities for recreation. Mr. Greaves-Lord, K.C., M.P., took the chair, and many philanthropic societies were represented. The Chairman said that venereal disease amongst seamen was a difficult problem. They were long from home and found special temptations to vice on their return, and counter-attractions were inadequate. Miss Agnes Weston had shown what missions could do, but not every seaman was amenable to them. Mr. Cuthbert Laws said that seamen should not be treated as children; they were just as sophisticated nowadays as other working men. Mr. Leonard Bowden, speaking for Mr. Havelock Wilson, of the Seamen's and Firemen's Union, said that excellent work had been done for many years by the union. It was necessary to get rid of the idea that a cup of coffee in a draughty, white-washed room was a sailor's idea of a good time in port. There ought to be a club on every ship, and recreation grounds should be available at all times for men coming ashore. Mr. E. B. Turner said that what the sailor needed specially was recreation. Organised recreation was mainly responsible for a reduction of the figures for venereal disease amongst troops at Aldershot from 327 per 1000 in 1885 to 30 in 1913. Athletic clubs should welcome seamen as visitors or spectators; a love of sport must be implanted. Fleet-Surgeon W. E. Home said that there were two sides to the question; lack of self-control amongst civilians must not be forgotten. If sailors could not talk to good women in port they would talk to a bad one. In the U.S.A. a scheme had been started in which attractive and able women of character set themselves to organise entertainment. Admiral Tupper said that young men should go on board ships in port and persuade the sailors to come ashore and play games. Mr. Ganley advocated sexual education in elementary schools. Mr. Barker pointed out that existing societies were doing good work, which was only limited by lack of funds. Mrs. Neville Rolfe, secretary of the British Social Hygiene Council, made three propositions—that municipal authorities should provide recreation facilities for sailors coming into port; that retired seafaring men should coördinate such facilities in their ports and encourage seamen to use them; and that decent citizens should open their homes to men on whom their prosperity often depended. A resolution was adopted advocating coöperation by the various organisations concerned.

Medical Diary.

SOCIETIES.

THE ROYAL SOCIETY, Burlington House, Piccadilly, W.
THURSDAY, March 11th.—4.30 P.M. *The following papers will be read:* J. A. Campbell: The Effects of Ultra-Violet Radiation upon the Metabolism of Healthy Subjects. (Communicated by Dr. Leonard Hill.). E. Ponder: A Study of Certain Forms of Inhibition and Acceleration of Hæmolysis. (Communicated by Sir E. Sharpey Schafer.) S. B. Schryver and H. W. Buston: The Isolation of Some Undescribed Products of Hydrolysis of Proteins. (Communicated by Sir John Farmer.) *Papers to be read in title only:* A. W. Greenwood and F. A. E. Crew: Studies on the Relation of Gonadic Structure to Plumage Characterisation in the Domestic Fowl. (Communicated by Prof. R. C. Punnett.) E. P. Cathcart and W. A. Burnett: The Influence of Muscle Work on Metabolism in Varying Conditions of Diet. E. Fischer: The Heat Liberated by the Beating Heart. (Communicated by Prof. A. V. Hill.)

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.
MONDAY, March 8th.—5 P.M., WAR, at the Royal Army Medical College, Grosvenor-road, S.W. Demonstrations on Recent Work on Problems of Hygiene by Surgeon-Commander T. B. Shaw, R.N., and officers of the Hygiene Department, Royal Army Medical College.
TUESDAY.—8.30 P.M., SURGERY, MEDICINE, ELECTRO-THERAPEUTICS, and THERAPEUTICS. Discussion: The Treatment of Exophthalmic Goitre (contd.). 8.30 P.M., PSYCHIATRY. Dr. Thomas Beaton: The Clinical Relationship between Psychological Disorders.
WEDNESDAY.—8.30 P.M., SURGERY, MEDICINE, ELECTRO-THERAPEUTICS, and THERAPEUTICS. The Treatment of Exophthalmic Goitre (conclusion).
THURSDAY.—5.30 P.M., TROPICAL DISEASES AND PARASITOLOGY. Dr. J. Gordon Thomson: Pseudo Parasites of Man. Mr. J. Ramsbottom: The Classification of Pathogenic Fungi. 8 P.M., NEUROLOGY, at the National Hospital for the Paralysed and Epileptic, Queen-square, W.C.
FRIDAY.—5.30 P.M. (Cases at 5 P.M.). CLINICAL. Dr. Dorothy Hare: Rheumatoid Arthritis with Multiple Fibrous Nodules. Dr. L. S. T. Burrell: Charcot's Joint. Dr. Bernard Myers and Mr. Rodney Maingot: Splenectomy for Three Cases of Essential Thrombocytopenic Purpura Hæmorrhagica. Dr. Saxby Willis: Sarcoma of Thorax. Dr. Chandler: Diabetes in a Child associated with Pancreatic Cyst. 5 P.M., OPHTHALMOLOGY. Clinical Meeting at the Royal London Ophthalmic Hospital, City-road (Moorfields), E.C.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.
MONDAY, March 8th.—8.30 P.M., Discussion on Obscure Pyrexia in Adults, to be introduced by Sir Thomas Horder, Bart., and Dr. C. E. Lakin.

BIOCHEMICAL SOCIETY.
SATURDAY, March 13th.—2.15 P.M. (in the Biochemical Department, University College, Gower-street, W.C.). C. R. Harington: Chemistry of Thyroxin: (*a*) Method of Isolation from the Thyroid Gland. (*b*) Constitution and Synthesis of Iodine-free Thyroxin. H. J. Channon: Some Experiments on the Biological Significance of Squalene (Spinacene). H. J. Channon and G. F. Marrian: An Unidentified, Unsaturated Hydrocarbon Occurring in Mammalian Liver. I. M. Heilbron: The Chemical Nature of Squalene (Spinacene). F. H. Carr and E. A. Price: Colour Reactions Attributed to Vitamin A. H. Jephcott and A. L. Bacharach: Studies in the Vitamins of Cod-Liver Oil, Part I. H. S. Raper: The Production of 3·4 Dihydroxy-phenylalanine from Tyrosine by the Action of Tyrosinase. R. K. Cannan, P. Haas, and T. G. Hill: Oxidation-Reduction Potential of Hermidin (Chromogen of Mercurialis perennis). C. Dorée and E. C. Barton-Wright: A Note on the Stone-Cells of the Pear. Margaret H. O'Dwyer: On the Nature of the Hemicelluloses. H. D. Carey: The Relation Between Hydrogen Sulphide, Hyposulphites, and Thiosulphates; by a New Method of Structural Formulæ. E. Ponder: The Shape of the Erythrocyte and its Respiratory Function.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.
TUESDAY, March 9th.—5 P.M., Prof. W. W. C. Topley: Experimental Epidemiology (last Milroy Lecture).
THURSDAY.—5 P.M., Dr. Bernard Hart: Development of Psychopathology, and its Place in Medicine (first Goulstonian Lecture).

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn-fields, W.C.
FRIDAY, March 12th.—5 P.M., Sir Arthur Keith: Demonstration on Parts concerned in the Secretion an Absorption of Cerebro-spinal Fluid.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W
WEDNESDAY, March 10th.—Dr. Harrison: Blood Analysis and Discussion of Selected Laboratory Reports.
THURSDAY.—4 P.M., Mr. A. T. Pitts: Care of the Mouth.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, March 8th, to SATURDAY, March 13th.—Fellowship of Medicine lecture, at the Medical Society, 11, Chandos-street, W. Thursday, at 5 P.M., Colonel F. E. Fremantle, M.P., on the Economics of Public Health. Free to all members of the medical profession. Special afternoon demonstration in Clinical Surgery on Thursday, at 5 P.M., at St. Mark's Hospital, by Mr. E. T. C. Milligan. —CHELSEA HOSPITAL FOR WOMEN, Arthur-street, S.W. Post-graduate course in Gynæcology. Operations, lectures, and demonstrations daily.—ROYAL EYE HOSPITAL, St. George's Circus, Southwark, S.E. A series of demonstrations on the Diagnosis and Treatment of Diseases of the Eye. Monday to Friday, every afternoon at 3 P.M. Further information from the Secretary of the Fellowship of Medicine.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY, March 8th.—10 A.M., Surgical Out-patients: Mr. W. E. Tanner. 10.30 A.M., Gynæcological Operations: Mr. A. E. Giles: Throat, Nose and Ear Operations: Mr. W. Ibbotson. 2 P.M., Medical, Surgical, and Gynæcological Clinics, Operations. 6.30 P.M., Venereal Department.

TUESDAY.—2 P.M., Medical, Surgical, Throat, Nose and Ear Clinics, Operations. 4.30 P.M., Mr. W. Ibbotson: Treatment of Chronic Rhinitis.

WEDNESDAY.—10.30 A.M., Surgical Operations: Mr. E. Gillespie. 2 P.M., Medical, Eye, and Skin Clinics, Operations. 5.30 P.M., Venereal Department.

THURSDAY.—10.30 A.M., Dental Out-patients: Mr. E. S. Pierrepont. 2 P.M., Medical, Surgical, and Throat, Nose and Ear Clinics, Operations. 5 P.M., Operations.

FRIDAY.—10.30 A.M., Eye Operations: Mr. N. Fleming. 2 P.M., Surgical, Medical, and Children Clinics, Operations. 3 P.M., Gynæcological Clinic. 6.30 P.M., Venereal Department.

NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC, Queen-square, Bloomsbury, W.C. 1.

POST-GRADUATE COURSE: FEBRUARY-MARCH, 1926.

CLINICAL LECTURES AND DEMONSTRATIONS.

MONDAY, March 8th.—2 P.M., Out-patient Clinic: Dr. Hinds Howell. 3.30 P.M., The Neuro-Muscular System, III., The Voluntary Motor System: Dr. Kinnier Wilson.

TUESDAY, March 9th.—2 P.M., Out-patient Clinic: Dr. Walshe. 3.30 P.M., Compression Paraplegia: Dr. Hinds Howell.

THURSDAY, March 11th.—2 P.M., Out-patient Clinic: Dr. Kinnier Wilson. 3.30 P.M., Epilepsy: Dr. Martin.

FRIDAY, March 12th.—2 P.M., Out-patient Clinic: Dr. Adie. 3.30 P.M., The Neurono-fixative Poisons, Tetanus, Rabies, Diphtheria: Dr. Collier.

The fee for the Course, including Pathology lectures, is £5 5s. For those who hold Perpetual Tickets the fee is £3 3s.

Mr. Armour and Mr. Sargent operate at the Hospital on Tuesday and Friday mornings at 9 A.M., or at such other times as may be announced.

Any part of the Course may be taken separately. Special arrangements will be made for those unable to take the whole Course.

Fees should be paid to the Secretary of the Hospital at the Office on entering for the Course.

J. G. GREENFIELD, Dean of Medical School.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, Leicester-square, W.C.

TUESDAY, March 9th.—5 P.M., Dr. Wilfrid Fox: Nævi.

THURSDAY.—5 P.M., Dr. H. G. Adamson: Benign Growths of the Skin.

CENTRAL LONDON THROAT, NOSE AND EAR HOSPITAL, Grays' Inn-road, W.C.

FRIDAY, March 12th.—4 P.M., Dr. Andrew Wylie: Growths of the Larynx.

UNIVERSITY OF SHEFFIELD POST-GRADUATE CLINICS.

FRIDAY, March 12th.—3.30 P.M. (at the Royal Infirmary), Mr. Finch: The "Chronic" Abdomen.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE LECTURES.

TUESDAY, March 9th.—4.15 P.M., Dr. W. B. Anderton: Criminal Abortion.

FRIDAY.—4.15 P.M., Dr A. Ramsbottom: Demonstration of Medical Cases.

Appointments.

GIBSON, JOHN M., M.D., D.P.H. Belf., has been appointed Medical Officer of Health and School Medical Officer for the Borough of Hyde.

North Middlesex Hospital: BROWN, L. G., M.D. Oxf., F.R.C.S. Eng., Oral Surgeon; DE CAUX, F. P., L.R.C.P. Lond., M.R.C.S., FRANCIS, C. P., M.B., B.S. Lond., Anæsthetists.

Certifying Surgeons under the Factory and Workshop Acts: THISTLETHWAITE, W., M.B., Ch.B. Leeds (Sherburn); GLEN, C., M.B., Ch.B. Glasg. (Cumbernauld, Dumbarton).

Vacancies.

For further information refer to the advertisement columns.

Birmingham, Queen's Hospital.—H.P., H.S.'s, Cas. H.S., and Res. Anæsthetists. Each £70. Also Pathologist. £100.

Bolingbroke Hospital, Wandsworth Common, S.W.—Res. M.O. £200.

Bradford, Grassington Sanatorium.—Med. Supt. £100.

Brighton, New Sussex Hospital, Windlesham-road.—H.S. At rate of £50.

Capetown City.—Asst. M.O. £800.

Cardiff City Mental Hospital, Whitchurch, near Cardiff.—Res. Clin. Asst. for six months. 50 guineas.

Cardiganshire County Council, Aberystwyth.—M.O.H. £800.

Carlisle, Cumberland Infirmary.—Jun. H.S. At rate of £135.

Central London Ophthalmic Hospital, Judd-street, W.C.—Asst. S.

Charing Cross Hospital.—Surg. Reg., Med. Reg. Each £150. Also Obstet. Reg.

Chester Royal Infirmary.—Asst. H.S. £125.

Croydon Mental Hospital, Upper Warlingham, Surrey.—Asst. M.O. £350.

Dreadnought Hospital, Greenwich, S.E.—H.S. and H.P. Each at rate of £110.

Folkestone, Royal Victoria Hospital.—Res. M.O. At rate of £150.

Freemasons Hospital and Nursing Home, 237, Fulham-road, Chelsea, S.W.—Res. M.O. At rate of £250.

Hampstead Borough.—Four Consulting Obstetricians.

Hospital for Epilepsy and Paralysis, Maida Vale, W.—Hon. S. to Ear, Nose, and Throat Dept.

Hospital for Women, Soho-square, W.—Res. M.O. At rate of £100.

Hull City and County of Kingston-upon-Hull Maternity and Child Welfare Dept.—Asst. M.O. £600.

Hull Royal Infirmary.—Asst. H.S. £150.

Hull, Victoria Hospital for Sick Children, Park-street.—Res. H.P. £80.

Lancashire County Mental Hospital, Rainhill.—Fifth and Sixth Asst. M.O.'s. £350.

Liverpool Eye and Ear Infirmary, Myrtle-street.—Hon. Asst. S.

Liverpool Port Sanitary Authority.—Asst. Port M.O. £700.

London Hospital, E.—Gynæcological Reg. £400. Also Cardiographic Dept., Paterson Research Scholar. £400.

London Lock Hospital, 283, Harrow-road, W.—Second H.S. £150.

Manchester, St. Mary's Hospitals.—Three H.S.'s. Each at rate of £50.

Middlesex Hospital, W.—Reg. to Ear, Nose, and Throat Dept. £300.

National Hospital for the Paralysed and Epileptic, Queen-square, W.C.—Med. Reg. £200. Also Orthopædic S.

Newcastle-upon-Tyne, Hospital for Sick Children.—Sen. and Jun. Res. M.O.'s. At rate of £120 and £100 respectively.

Northampton General Hospital.—Hon. Asst. S.

Northumberland County Council, Wooley Sanatorium, near Hexham.—Asst. Med. Supt., &c. £600.

Plymouth, Homœopathic and General Hospital.—H.S. £150.

Queen's Hospital for Children, Hackney-road, Bethnal Green, E.—Res. M.O. £200. H.P. At rate of £100.

Royal Free Hospital and Lond. Sch. of Medicine for Women, Gray's Inn-road, W.C.—Sen. Asst. Path. Full-time. £600.

Royal Northern Hospital, Holloway, N.—H.S. and Obstet. H.S. Each at rate of £70. M.O. to Out-patients. At rate of £125.

St. Bartholomew's Hospital.—Chief Assts. in Ophth. Depts.

St. John's Hospital, Lewisham, S.E.—Res. H.S. At rate of £100.

St. Luke's Hospital, Cale-street, Chelsea, S.W.—First Asst. M.O. £420.

St. Mary's Hospital, Institute of Pathology and Research.—Research Studentship. At rate of £200.

St. Paul's Hospital for Skin and Genito-Urinary Diseases, Endell-street, Holborn, W.C.—H.S. £200.

Salisbury General Infirmary.—H.S. £150.

Stockton-on-Tees, Stockton and Thornaby Hospital.—Sen. H.S. £250.

Sunderland Royal Infirmary.—H.S. £140.

Tottenham Maternity and Child Welfare Committee.—Asst. M.O. at the Ante- and Post-natal Clinics.

Wallsall General Hospital.—Sen. H.S. and Jun. H.S. At rate of £175 and £125 respectively.

Weir Hospital, Grove-road, Balham, S.W.—Jun. Res. M.O. £100.

West London Hospital, Hammersmith, W.—H.P. and two H.S.'s. Each at rate of £100.

Windsor, King Edward VII. Hospital—Hon. Asst. S.

York County Hospital.—H.P. £150.

The Chief Inspector of Factories, Home Office, London, S.W., announces vacancies for Certifying Factory Surgeons at Fordingbridge (Hants), Conway (Carnarvon), and at Bradford, South (Yorks, W. Riding).

Births, Marriages, and Deaths.

BIRTHS.

CHURCHER.—On Feb. 24th, the wife of D. G. Churcher, F.R.C.S., Tarporley, Cheshire, of a son.

MARRIAGES.

BURKE—BLACKWOOD.—At St. Cuthbert's Parish Church, Edinburgh, on Feb. 18th, by the Rev. J. Donald Beattie, B.A., Myles Edmund Towers Burke, L.R.C.P. & S. Edin., and L.R.F.P. & S. Glasgow, Finchley, London, to Margaret M'Arthur Blackwood, Logan Cottage, Dunbar.

KNAGGS—SMITH.—At St. George's Church, Bickley, by the Rev. Canon Baggallay, Robert Lawford Knaggs M.C.Cantab. F.R.C.S., to Adrienne Ernestine Blanche (neé Blouet-Dargonne), widow of Morton William Smith, Recorder of Rochester.

DEATHS.

TRESIDDER.—On Feb. 23rd, at Askern, Edward Stanley Tresidder, M.R.C.S. Eng., L.R.C.P. Lond., in his 67th year.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

THE DIARY OF A PARAPLEGIC PATIENT.

BY E. GOWLLAND, D.S.O., M.B. LOND.,

LIEUT.-COLONEL, T.D.; COMMANDANT, STAR AND GARTER HOME FOR DISABLED SAILORS AND SOLDIERS, RICHMOND, SURREY.

THIS is an attempt to give some idea of the normal daily routine of many of the patients in the Star and Garter Home for Disabled Sailors and Soldiers, suffering from the effects of wounds and injuries of spine and resulting paraplegia, which will indicate the meticulous care which is essential in order to avoid deformities and the occurrence of bedsores with subsequent infection of bladder, kidneys, &c., and will emphasise the necessity for constant attendance by skilled nurses and orderlies in this class of work

The routine starts at 5.30 A.M., when a cup of tea is brought to the patient by a night orderly. At 6 A.M. he is either washed or a bowl of water is brought to him. This process being finished he turns to his morning paper, which he peruses until 8 A.M., when breakfast is served, tea or coffee being placed on a locker within easy reach. Breakfast finished, the day's treatment commences. Where the paralysis is complete in the lower half of the body an enema is administered two or three times a week, as these men are incontinent, and it is only by frequently clearing the lower bowel that they are enabled to get up and pursue any avocation without danger to themselves and considerable unpleasantness. The enema has not the same effect as on an ordinary individual. The bowel empties itself very gradually and necessitates constant attention, the draw sheet having to be frequently changed to avoid soaking in fæcal matter, which might precipitate the much-dreaded danger of bedsores or trophic ulcers. It must be realised that after removal of the bed-pan there usually occurs a prolonged "leaking." After this process, which takes from one to one and a half hours, the bladder is washed out, and should the patient have a suprapubic opening, the suprapubic tube is changed, and a fresh sterilised tube is inserted and strapped to the abdominal wall. This takes about 20 minutes. Then, two or three times a week he is bathed (unless he is a suprapubic case). This means that the patient has to be lifted from his bed to his ward chair and wheeled by an orderly to the bathroom, where pyjamas or night clothes are removed from him, and he is lifted into the bath and washed by an orderly. He must then be lifted from the bath, usually by two orderlies, and placed in a blanket which has been spread over his ward chair. He is thoroughly dried, quickly wheeled back, and lifted into his bed, his pyjamas then being replaced. On the days when he is not bathed he may be given a radiant heat bath, diathermy, or such other treatment as may be ordered for the relief of painful spasm of legs, &c. On his return to bed the nursing sister arrives with a dressing trolley. His back is thoroughly rubbed with methylated spirit; any trophic ulcers are cleaned and dressed, careful attention being given to all bony prominences at the lower part of the back and hips, which are then padded with Gamgee tissue, this being secured by a many-tailed bandage. Attention is then given to the knees, heels and ankles, which are rubbed (using firm, circular movements) with methylated spirit. The heels are protected from pressure on the bed by placing a small cushion under the Achilles tendons. The feet are propped up by a firm bolster, and small cushions are placed under the knee-joints to prevent hyperextension. The toes and knees are protected from the weight of bedclothes by the constant use of a cradle. When this process is finished he is ready for his massage, and it is found that 20 to 30 minutes massage of legs, back, and abdomen, together with passive movements, is essential for the well-being of these cases.

The patient now rests until about 11.30, when an orderly proceeds to dress him on his bed; his rubber urinal is fixed, and he is again lifted into his ward chair. This process takes some 20 minutes. The method of adjusting a paraplegic into a ward chair is not so simple as it may sound—air cushions and other cushions have to be carefully arranged to suit individual requirements, the patient's legs have to be carefully placed on the foot-board, and in many cases strapped down, as so many of these men suffer from severe spasmodic contractions. Our paraplegic now proceeds to a lift, which takes him down to the dining hall, where specially designed furniture enables him to sit comfortably up to the table. After dinner many of the men who are interested in handicrafts go to the various workshops—engineering, carpentry, spinning, leather-work, basket-work, boot repairing, photography—for all of which occupations facilities are provided in this home. Three of our men also edit and run a quarterly magazine for the home. Others go to the common room, where they, perhaps, play cards or other games, or to the billiards room, where they play from their chairs, and many of these men play quite a good game, frequently making breaks of 20 and over. It is extremely difficult to play from one of these wheeled chairs, even for a man who is normally a good player.

It will thus be seen that their life is comparatively strenuous, considering that most of them are completely paralysed "below the belt." They have tea about 3.30, after which, on two or three days a week there is some afternoon entertainment either in the common room or cinema hall. Supper at 7 P.M., after which a large number go back to their beds, again being lifted from chair to bed and undressed by an orderly. Subsequently, toilet of the back is again carried out by a nursing sister. Medicines, such as aperients, are given at about 9 P.M., when lights are lowered and the night sister and orderly take over the patient. His rubber day urinal is changed for the "swan neck" bottle urinal, and after perhaps listening for an hour to a wireless concert he goes to sleep. The nights, however, are by no means undisturbed. About 1 A.M. the urine bottle is emptied, cleansed and replaced, and it not infrequently happens that he wakes to find that his bowels have acted and he is lying in excrement, in which case an orderly is summoned, who washes and cleanses the patient and changes his draw-sheet. The urine bottle must always be carefully watched by orderlies; any overflow means the soaking of the patient and again cleansing and changing of draw sheet.

It must be realised that most of these patients have lost both sensation and power of movement, so that it is essential that nursing sisters and orderlies shall be ever on the alert to prevent excretory mishaps, not that these mean immediate discomfort to the patient (it would be better if they did!) but because of the danger: (1) of the occurrence of bedsores, and (2) of the infection of existing trophic ulcers, which dangers must always be borne in mind by those legislating for the adequate treatment of the paraplegic.

It must be remembered that in these cases: (1) the circulation in the skin is deficient; (2) the skin is very apt to break down under quite minor irritations; (3) the infection of an existing trophic ulcer, or the occurrence of a new bedsore is fraught with danger to the patient, by reason of the fact that any septic infection in such cases is very liable to be followed by a general infection, cystitis, or pyelitis—and pyelitis is almost always the "end condition" in the paraplegic.

These patients nearly always spend one or two days per week entirely in bed—usually their "enema days." Most of them go out in hand-propelled tricycles, with or without a motor attachment; they must be lifted into these vehicles from their ward chairs and carefully arranged therein, with air cushions, pillows, &c., and, of course, lifted back on their return. The terms "trophic ulcer" and "bedsore" have been used—these terms may appear synonymous. In this paper, however, the differentiation is meant to indicate that a trophic ulcer is an inevitable occurrence and cannot be healed (but it can be kept surgically clean); whereas a bedsore is an accident and can normally be healed. In this sense a "bedsore" is usually an indication that details of nursing technique have not been thoroughly carried out, and it is interesting to note that many patients, on return from leave, exhibit bedsores.

It will be gathered that the working day of the paraplegic patient and of those who are privileged to look after him is indeed a strenuous one, and it is only by cheerful coöperation on the part of the one, together with assiduous attention to the rules of surgical cleanliness and good nursing on the part of the others, that these cases can be maintained in such a state of health that they are able to participate in, and enjoy, some of the pleasures and entertainments of those who are not so grievously afflicted.

THE FOOD OF THE COUNTRY.

To the Editor of THE LANCET.

SIR,—In reference to your note in THE LANCET of Feb. 20th with this title the sad truth seems to be that the French partly, and we ourselves in a greater degree, have lost the hearty intelligent zest of our forefathers; we have become less critical; we take less trouble with our meals, think about them less, talk about them less, read about them less. In what kitchen now is the carp, "that is so curious to be caught," turned, as Izaak Walton directs, into "so curious a dish, as shall make him worth all your labour and patience"? Sad lines for the English gourmand are those that follow. Where now is the popular writer who rhapsodises over meals like a Dickens or a Disraeli, revels in them hugely like a Sala, philosophises over them like a Peacock? Alas, the pleasures of the table have ceased to provide good "copy"; instead, and it is as if we were a nation of invalids, we have columns in the newspapers devoted to vitamins and peptones and such dark matters, which may intrigue the public, but bore

woefully those who know something of the subject. For many things are as essential to a meal as vitamins, or, which is the same thing, wholesome food. Obviously, the better the food, the better for those that eat it; but that is only the alphabet of the language of real dietitians, and any grown man, not mentally deficient, knows well enough what food or substance will "agree" or "disagree" with his internal mechanism. "Victims of indigestion," Brillat-Savarin roundly declares, "are those who know not how to eat." The gourmand knows more than simply how to eat. As we eat to live, so to live well we must eat well; if we would enjoy life we must enjoy our eating; and this is a higher ideal than a mere combination of nourishment and good digestion. Breakfast, on working days, may pass if it attains those salutary ends; the mid-day meal, if money-getting is the order of the afternoon, may also be severely practical; but dinner at the day's end should provide an intellectual no less than a physical recreation, and a man should rise from it refreshed alike in body and soul.

The strictly necessary foundations of such a meal, besides good food, are good cooking and prompt service; good wine, if the occasion warrants it; congenial company; and cheerful surroundings. I am perfectly aware that much of this is unattainable to-day, for nearly all of us as a *routine*—I set it out as an *ideal*. Many a dinner is eaten as a ceremony lacking one or more of these essentials; and if it is difficult to decide whether one is more important than another, this much is certain, that for each that is lacking the cost is a proportionate loss of recreation. Luxury, says Savarin, is by no means necessary (though he is far from decrying it in general); it costs little more to eat good food than to eat bad; the company and surroundings are within the reach of most men; in the matter of wines, Prof. Saintsbury's "Notes for a Cellar Book" are an unfailing guide. Cookery, whether regarded as an art, a science, or a hobby, is something that may be learnt, or at the least something that any man may learn to appreciate; but if he learns to cook ever so modestly, it is to his advantage; to have fried an egg as well as it can be fried is a step towards detecting the peculiar excellence of the wing on which a partridge rests its weight during its hours of sleep.

But with all this, the essence of good eating has yet to be named. It is best conveyed, perhaps, in the word "gusto." What matters above all is the spirit in which a man approaches his meals. They should be approached, at least once in the day, not as an inevitably recurring feature of the business of living, but as a joyous rite, a ceremony of thanksgiving. For good things, said the sage, were created for good folk; else we should be forced to conclude, profanely, that God created them for sinners.

We are a nation of individualists, and there are gourmands still in our midst; and it is, or should be, well known that they are among the happiest and most contented of mortals. But in a thousand restaurants, so-called, and in a million homes, the word of St. Savarin is daily ignored; and there should be a national recognition of the truth, that gourmandism is not gluttony; when a national habit of deliberately enjoying "good cheer" (to use a fine phrase that is in danger of dropping out of the language) would follow.

I am, Sir, yours faithfully,

Feb. 25th, 1926. BON-VIVANT.

ADRENALIN FOR PARAPHIMOSIS.

To the Editor of THE LANCET.

SIR,—Some little time ago I had occasion to write to the makers of "Adrenalin," and mentioned that I had found their preparation useful in cases of paraphimosis, and they informed me that it was, to them, a new use of the substance. I therefore venture to suggest its use in such cases; the swollen and congested mucous membrane and glans become much smaller under gentle pressure after being well moistened with the "Adrenalin," and reduction is then accomplished.

I am, Sir, yours faithfully,

Feb. 25th, 1926. M.B.

THE STUDY OF HYGIENE.

THE reception held on Feb. 25th at the Institute of Hygiene was a useful reminder of the patient work that is always being done, largely behind the scenes, to improve living conditions in this country. The Institute was founded in 1903, and its work has been steadily growing ever since. The public owes it much for its promotion of the study and practice of everything that makes for healthy, clean, and efficient living. Its membership includes a great many foreign authorities on public health. It convenes conferences on important questions of communal hygiene, organises lectures by medical and scientific men, and founds scholarships. Some of its most important work is directed against adulteration and false description, and it examines proprietary foodstuffs in its laboratories and issues a diploma to manufacturers whose products conform to its standards; this guarantee expires at the end of every year. The Institute maintains a large museum (with a permanent staff of demonstrators), at its headquarters at 28, Portland-place, where anyone interested may inspect samples both of healthy and injurious articles of food, drink, and clothing. The hall-mark of the Institute is now becoming familiar to the general public, and makers regard it as a valuable possession.

The guests whom Sir Thomas Oliver received on Feb. 25th saw, besides the permanent exhibits, a large number of interesting additions. The infant section, conducted by the Central Council for Infant and Child Welfare, showed photographs of the work done at centres and hospitals, with educational appliances and propaganda pictures, and the demonstrations of cooking in the domestic section were popular. Microscopes with slides of food adulterants and parasites were shown, and a demonstrator from a firm manufacturing chemical apparatus gave a display of practical glass-blowing. Amongst the visitors was a group of foreign public health officers who are studying conditions and methods in this country under the auspices of the health department of the League of Nations.

ROYAL SUSSEX COUNTY HOSPITAL, BRIGHTON.

"OUR main building is 100 years old, and the site does not easily lend itself to expansion. Our accommodation is taxed to breaking point and a vast amount of work will have to be done if the hospital is to be made worthy of the county." So runs the annual report presented to the governors of the Royal Sussex County Hospital on Feb. 18th. Brigadier-General d'A. C. Brownlow, the chairman, said that the governors had engaged the services of Colonel D. J. Mackintosh to advise them on future extension. His scheme was divided into three parts, the first of which had been approved. This was the enlargement of the nurses' home and the building of an annexe for domestic servants. The second part was the construction of more wards, or, alternatively, of a recovery home, whilst the third was a plan for general improvement and expansion of the existing departments. General Brownlow said that on the day before that meeting there had been 222 cases in hospital, which had left only three beds for emergencies and casualties. There was a waiting list of 117. Thanks to rigid economy and a very close supervision of all expenditure, the total income had exceeded expenditure by £1,153, but the annual subscriptions, despite many urgent appeals, showed an increase of only £56. "We are up against a mountain of apathy," General Brownlow declared. At certain times there was a good deal of enthusiasm, but it was usually confined to a very small section. The governors placed on record the loss the hospital had sustained by the death of Dr. J. F. Gordon Dill, honorary consulting physician. "Dr. Dill's services to the hospital extended over a period of 36 years. He will always be remembered as the founder of the Sussex Provident Scheme. His shrewd and ready advice is much missed in our counsels." Lord Leconfield, lord-lieutenant of the county of Sussex, was elected President for the year.

INFANT WELFARE IN THE FEDERATED MALAY STATES.

IN the annual report of the infant welfare centre at Kuala Lumpur, Dr. Josephine Were, the medical officer to the centre, is able to point to satisfactory progress in many directions during the year 1924. The centre is primarily an educational institution, providing advice and teaching for young mothers of many nationalities in the care and management of their infants. The teaching is largely individual, since the mothers, especially the Chinese and Malays, are both ignorant and superstitious. The prejudice against allowing the babies to be weighed is gradually being overcome, but there is still a good deal of difficulty in getting the mothers to believe in the necessity of a daily bath for their infants, and an even stronger objection on their part to removing a charm. One such charm consisted of a dog licence bearing the inscription "1915. Selangor, one dog. 1669."

Antenatal work is steadily going forward, the number of expectant mothers attending the antenatal clinic having been nearly trebled during 1924. Another very satisfactory advance is the almost entire disappearance of the prejudice against the visits paid to the homes by the health visitors. This health visiting is particularly valuable in bringing mothers and babies in remote districts into contact with the centre.

Apart from the work of the infant welfare centre itself, the most valuable propaganda work undertaken during the year was the infant welfare exhibition and the baby competition at the Malayan Agri-Horticultural Exhibition, held at Kuala Lumpur. Large numbers of Asiatics of all classes visited the exhibition and displayed the keenest interest in it. The baby competition, which was the first of its kind in the Federated Malay States, was also a marked success, and proved to be the most useful propaganda work so far undertaken.